DURO-LAST®
THE WORLD'S BEST ROOF®

February 7, 2022

Ms. Kaitlyn Battles
Buyer III
Brazos County
200 S. Texas Ave., Ste. 352
Bryan, TX 77803
kbattles@brazoscountytx.gov
979-361-4285 Office
979-446-9242 Cell

Re: Re-Roofing Project for the Brazos County Detention Center

Dear Ms. Battles:

Duro-Last Roofing has developed the following pricing proposal to re-roof the Brazos County Detention Center in Bryan, Texas. This proposal was developed using Duro-Last's contract number 210205 with The Interlocal Purchasing System (TIPS) and includes the total cost to purchase and install the Duro-Last roofing system.

Duro-Last will provide the Duro-Last roofing system and its installation to Brazos County at RS Means pricing using the Bryan City Cost Index.

Pricing has been provided by the following authorized Duro-Last contractors:

- Lone-Star Roof Systems of College Station
- Trumble Construction, Inc. of Texarkana

Attached is the Duro-Last specification which defines the work that Duro-Last proposes to complete. When the installation is complete, a Duro-Last Technical Representative will inspect the installation for completeness and conformity to Duro-Last specifications. Following acceptance of the roof, Duro-Last will issue a warranty to Brazos County.

The Duro-Last Roofing 20-year NDL warranty provides for the repair or replacement of the roofing system, and the labor to install it, in the event of a defect in the Duro-Last products. The 20-year NDL warranty does have an additional charge to obtain it, which has been included in the proposal. The warranty also does not provide coverage of consequential damages resulting from leaks caused by any defects covered under the warranty.

For metal roof areas: When the installation is complete, MBCI will issue a Standard I 20-year Weathertightness warranty to Brazos County.

Based on this scope of work, pricing for Duro-Last to complete Brazos County re-roofing project is as follows. Prevailing wage rates apply.

	Lone-Star Roof Systems	Trumble Construction
Material, Labor, Warranty, Fees	$2,171,206.64	$1,941,213.70
Contingency	$195,550.26	$174,748.80
Bonds	$19,086.75	$17,064.21
Included in Base		
Total Cost	**$2,385,843.65**	**$2,133,026.71**
Site Supervision Add:	$600/Day	$600/Day

Duro-Last will invoice Brazos County for materials shipped and 30% mobilization upon initial shipment. Notwithstanding the above referenced base price, all non-Duro-Last materials, including any third-party materials purchased for the project, will be invoiced by Duro-Last to Brazos County at the market price paid by Duro-Last at time of payment to any such third-party supplier.

Any alterations or deviation from the scope of work involving extra costs including, but not limited to, additional materials and labor will be executed only upon written change-orders submitted to Duro-Last, which will result in an extra charge over this proposal.

The base price does not include any allowances for roof deck replacement or for other hidden damages.

Permit costs are included in the base price. The building owner is responsible for obtaining any additional permits, engineering fees, or tests needed to meet state and local codes.

The base price includes performance and payment bonds. Any bonds for this project shall only apply for a one-year maintenance period commencing on the date of substantial completion of the project. Bond coverage shall not be extended to the 20-year warranty period subsequent to the one-year maintenance period.

Duro-Last Roofing and its subcontractor are not responsible for the following:

- HVAC alteration and related utility work
- Lightning, lightning protection, or electrical alterations or recertification
- Satellite dishes or antenna recalibration
- Removal of material containing asbestos or asbestos testing
- Ponded water due to previous existing substrate conditions

All material is guaranteed to be as specified. All work will be completed in a workmanlike manner according to standard roofing practices and in accordance with Duro-Last published specifications. Duro-Last Roofing shall not be responsible for delays relating to weather, accidents, or other events beyond our control.

If this proposal is accepted, the Duro-Last TIPS price schedule, terms, and conditions will be applied. In addition:

1. Brazos County's TIPS membership will need to be verified.
2. A purchase order and tax exempt certificate will need to be issued to Duro-Last Roofing.
3. The purchase order should be clearly marked "Per TIPS Contract".
4. E-mail the purchase order in PDF format to TIPS at tipspo@tips-usa.com for review and approval.
5. Duro-Last will issue a Notice to Proceed to the installing contractor after receiving the approved purchase order from TIPS.

If you have any questions regarding this proposal, please contact me at (989) 284-5391 or cplyler@duro-last.com.If this proposal is acceptable, please indicate the approved option(s), sign below and return with the aforementioned documents.

Best Regards,

Chenelle D. Plyler

Chenelle D. Plyler
Cooperative Purchasing Administrator
Duro-Last, Inc.

Brazos County Detention Center Re-Roofing Project Base Price:

	Lone-Star Roof Systems	Trumble Construction
Base Price	☐ $2,385,843.65	☑ $2,133,026.71
Site Supervision Add:	☐ $$00/Day	☑ $600/Day

Approved By: _____

Title: COUNTY JUDGE

Date: FEBRUARY 22, 2022

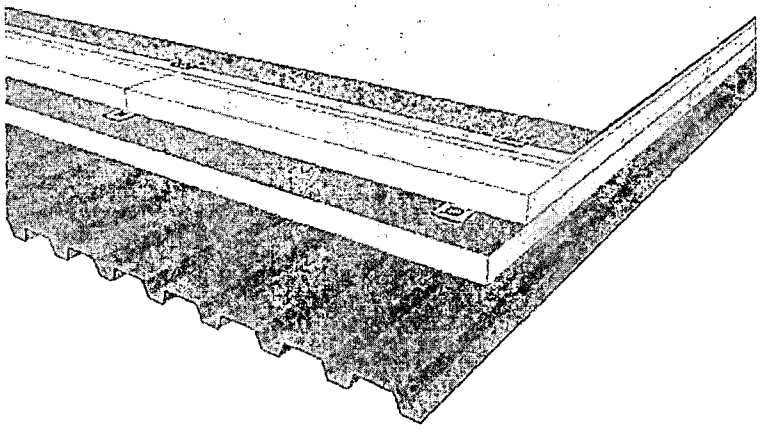
Brazos County Detention Center

1835 Sandy Point Rd
Bryan, TX 77807

Roof #s 1-10 and 13-15

Prepared For: Chenelle Plyler
Duro-Last Roofing, Inc

Prepared By: James Griffin
Duro-Last Roofing, Inc



Duro-Last Roof Assembly Description

- **New Roof System:**
  - **Duro-Last® Duro-Fleece™ membrane**
    - Membrane Thickness: 80 mil nominal (88 mil including fleece)
    - Color: White
    - Attachment: Adhered with Duro-Fleece CR-20 membrane adhesive, splatter applied
  - **DensDeck® Prime Roof Board**
    - Thickness: ¼ inch
    - Attachment: Attached with mechanical fasteners
  - **Duro-Guard® ISO II or EPS Type II (flat)**
    - **Thickness Varies by Roof # - See Scope Section 1.1**
    - Attachment: Loosely laid (Additional to Existing Insulation)

- **Existing Roof System(s):**
  - **Roof Area #s 1 - 7 and 15:**
    - PVC Single Ply Membrane (Scheduled to be removed and disposed)
    - EPS Flat Insulation board (3.5" Thick) (Inspect and leave in place)
    - ½" Gypsum Roof Board
    - **Steel Roof Deck**
  - **Roof Area #s 8 and 9:**
    - PVC Single Ply Membrane (Scheduled to be removed and disposed)
    - Polyurethane coating (Scheduled to remain in place)
    - Spray Foam Insulation (Varies 2" - 3" Thick) (Scheduled to remain in place)
    - **Steel Roof Deck**
  - **Roof Area #s 10, 13 and 14:**
    - PVC Single Ply Membrane (Scheduled to be removed and disposed)
    - **Duro-Guard® ISO II (flat) (2" thick)** (Scheduled to remain in place)
    - **Steel Roof Deck**

PART 1 GENERAL

1.1 SITE GUIDELINES

a. **Contractor Execution:**

i. **Contractor Proposal Form:** Contractor to submit RFP proposal response on RFP Proposal response form. No other forms will be accepted.

ii. **Background Information**: Contractor will supply all required background information required to comply with Brazos County requirements.

iii. **Insurance**: Contractor will submit proof of insurance (Certificate of Insurance) showing coverage that meets or exceeds all county requirements.

iv. **Permit Fee(s):** Contractor will include any Permit costs and will include any administration cost for submitting and/for filing for a permit, should a permit be required. The contractor will include all costs for submitting for permit and any cost to collect the permit and post the permit at the appropriate locations.

v. **Pre-Construction Meeting:** Prior to the execution contractor will attend a Pre-Construction meeting (Contractor Project Manager, Superintendent, Manufacturer Representative, Owner and Consultant) to review execution, scheduling, and general guidelines for the project. Contractor will submit submittals (PDF, Application Guidelines, Field Drawings, Warranties, Guaranties) prior to the Pre-Construction meeting for all required products and MSDS sheets. Contractor to provide a Project Contact Sheet with names, cell phones and email for all personnel to be involved with scope of work. (Project Manager, Site Project Manager, Crew

Superintendent and Office Contact) Contractor should submit a soft copy of these documents no later than 10 days prior to this meeting.

vi. **Site/ Project Manager:** Contractor to provide and maintain a minimum of one (1) non-working Project Manager to oversee operations, safety compliance and coordination with site personnel. Project Manager will report to Owner/Site Representative a minimum of once each morning and once each afternoon to assure site personnel are advised on all areas that construction activity will be taking place, coordination of any lifting activities and verify any areas of possible moisture entry from prior night or day.

vii. **Project Team Contact Sheet**: Contractor to provide an emergency contact sheet with email and cell phone contact numbers for all key personnel. Contractor to bring to Pre-Construction meeting.

viii. **Site Security:** Contractor to include all cost to comply with Brazos County Detention Center requirements. This is a secure facility with multi-roof areas and will require close coordination with Detention Center personnel.

ix. **Occupant Notification**: Contractor to post 8 ½ x 11" Notification at access / entry doors and exits notifying public and occupant of work currently active on at this site.

x. **Staging area:** Contractor will maintain a single designated staging area. All material storage, equipment storage is required to be kept at staging unless in use. All breaks, lunches, and safety meetings to be held in staging area at all times, unless authorized and identified with the Pre-Construction minutes. Contractor will stage equipment, material, and Company/ Crew vehicles in the assigned staging area location. Contractor will maintain a Porta John and wash area within the area. Staging area should be marked with safety cones and caution tape to help prevent accidental access by the public.

xi. **Storage:** Contractor is responsible for assuring that all material is secure on the roof and ground. All trash and debris should be bagged on a regular basis. Site should be free of wind-blown wrappers, trash, or debris. Contractor will maintain surrounding grounds with no debris, wrappers, water bottles etc. Contractor will bag all debris unless using a Skytrac and box for debris. At no time may contractor throw or discharge any materials or debris from roof. **This is a two-story building making it even more important that all material and equipment be away from the building edge.**

xii. **Signage**: Contractor will post one sign at the staging area identifying the site is an active construction site. Signage should include Company name, Office contact (Phone and Email) Site Project Manager name and phone number.

xiii. **Ground Protection**: Contractor will mark with cones on the ground whenever working within 10' of the perimeter over doors, exits and vehicle garage doors.

xiv. **Rain & Weather**: Contractor will have personnel on site or within 15-30 min. from the job site 7 days a week and including Holidays until substantially complete. At any time that the building is exposed to weather (Rain, Wind or Other) Contractor will meet Owner representative to assure all water tie offs are in place and to assure there is no moisture entry into the building. Contractor is responsible for keeping the building in a watertight condition from start of construction until complete. If crew or personnel dispatch for holidays or weekends contractor is required to maintain a minimum of two personnel 15-mile radius to respond, should it rain and

to daily inspect of staging area, inspection of roof loaded material and to inspect all water tie offs a minimum of twice daily on non-workdays.

xv. **Site Safety**: Contractor will adhere to all safety requirements while performing work on the site. This will include but not limited to the following:

1. Compliance with all OSHA requirements -See attached OSHA Bulletin-Roofing
2. Compliance with all County requirements
3. Contractor will maintain a clean and orderly staging area throughout execution. Staging area will include a porta john and be clearly marked with cones and caution tape. The area is to be clearly marked to avoid any accidental entry by the public. Contractor will maintain all crew trucks, lifting equipment, ext. in this area.
4. Lifting Equipment will always be stored in staging if not being used. Contractor will protect all parking lot surfaces with plywood to prevent any dripping of hydraulic oil or other. Contractor will chain the wheel to the axle when not in use. Contractor will provide a copy of the key or passcode to equipment. Contractor will avoid creating ruts or damage to the surrounding areas, buildings and/or land scape. Any signs of leaking or significant issues with Hydraulic equipment contractor will immediately switch out equipment and do so without interruption to the work.
5. Contractor will always maintain a fire Extinguisher in the staging area and at the roof where any gas filled generators are in use.
6. Contractor will install all required warning lines and fall protection as required throughout the execution of the work to protect the public and county personnel while on site performing repairs.
7. Contractor will provide their own access to and from the roof. Contractor crew is to refrain from entry, interior roof hatch or exit of the building. Only the Project Manager and Crew Superintendent shall access or traffic the building and only with an approved County escort.
8. Contractor will install safety cones along sidewalk leading up to all primary entrances and exits that are to remain open during repairs / construction.
9. Contractor will comply with all required work hours and special designated days by the county. Contractor should include and anticipate any costs associated with overtime and night or weekend work to complete this project. No change orders for overtime, weekend or night work will be permitted.
10. Contractor and crew will comply with all Covid-19 rules and procedures while on site performing work.
11. Contractor and crew will refrain from any smoking on site. Contractor, Crew and Contractor vehicles will refrain from any drug or illegal substances on person or use while performing work. No alcohol or other on site whether containers are empty or full. This includes person and/or vehicles.
12. **Crew Safety Vests:** All Contractor personnel on site will wear safety vest to allow ease of identification for building personnel and public. Contractor Crew Superintendent and Project Manager will wear a different colored safety vest for ease of identification of Owner Personnel and the Public.
13. **Safety Spotter:** Contractor will provide spotter personnel at the front and rear of any lifting equipment when equipment is be moved outside of staging area to assure that no public property or personnel can be damaged or hurt during

operation. Contractor will also utilize a spotter any time the crew may be working within 10'-15' of the perimeter of the roof. Should the contractor be required to expose the roof to below to occupant or public. (i.e., Skylights) Contractor will coordinate with County with County contact for coordination of the Area being exposed. Any such type of area should also be marked with cones to prevent the public from accidently walking into this area.

xvi. **Roof Access:** Contractor will provide their own exterior access to the building. All access points are to be removed when contractor is not on site or construction activity is not in process. Anyone accessing through the building must comply with all COVID-19 and CDC Guidelines. Contractor personnel will perform temperature checks each day and document each crew member result.

xvii. **Electrical Power:** Contractor will supply all the contractor required power for operation of equipment. Contractor is not allowed at any time to use Owners water, electrical receptacle or other in execution of this scope of work.

xviii. **Reconnect/ Disconnect:** Contractor is not authorized or allowed to disconnect any Mechanical units on the building. If for any reason the contractor feels it is necessary to disconnect a mechanical unit this must be approved in advance and scheduled with the Owner.

b. **CLOSEOUT DOCUMENTS & PAYMENT PROCESSING:** Contractor will submit a single and final invoice upon completion of the repairs for **Brazos County Roof Repair s- Brazos County Detention Center** to include the following:

i. **Contractor Warranty:** Contractor will provide the Contractor 5-year workmanship warranty for all work performed.

ii. **Final Inspection** 4T Partnership will schedule an inspection with the Contractor and the Owner/County to perform a walk through and inspection of the completed Roof assembly and all areas included in the contractor's scope of work. 4T Partnership will forward minutes and documentation of any items in need of correction or repair. Any punch items will be corrected during inspection or can be performed, and contractor can submit photos showing corrective action.

iii. **Contractor Invoice** – Contractor will submit a Final invoice with confirmation of completion of all punch list items and reference RFP III and building name with address.

iv. **Manufacturer "No Dollar Limit Guaranty**_– Contractor will submit a copy and provide the Owner with an original of the required 20-year NDL Guaranty. The Guaranty should reference the Correct Owner / Member Name, Building Address and include execution by the Manufacturer appropriate representative.

v. **"Conditional" Lien Release-** Contractor will submit a "Conditional Lien: Release with closeout documents including separate releases for any listed sub-contractors.

vi. **Performance & Payment Bond-** Contractor will submit a copy of the Payment & Performance bond.

vii. **Punch List Items Documentation-** Contractor will provide any necessary punch list / corrective action list and documentation showing each correction if required after the final inspection.

viii. **Brazos County Purchasing Documents**: Please Brazos County Purchasing requirements for any additional closeout documents.

c. **DELIVERY, STORAGE, AND HANDLING**

i. Store all materials in compliance with Manufacturer requirements to avoid water damage and store rolled goods on end. Comply with manufacturer's recommendations for job-site storage and protection. If necessary, cover with loose tarp or plastic and allow to breath.
ii. Contractor will adhere to all requirements regarding staging location, site management and occupant safety to assure that both Contractor(s) crew and public / County personnel and the public are protected at all times.
iii. Contractor will supply a duplicate key or Code to operate all equipment being stored on site to facilitate (if necessary) moving this equipment if required by first responders.
iv. Contractor / Crew will prevent any blowing debris throughout the execution of the work. All material will be properly secured. Any material roof loaded must be tied or secured when not performing repairs on site. All debris will be bagged and placed in a receptacle or dump trailer.
v. All material deliveries to be coordinated with **Brazos County Personnel**.
vi. Contractor will at no time while positioned on the roof load material or equipment from ridge to eave over entrance and exits of the buildings.

d. JOB CONDITIONS

i. The Contractor preparing a proposal in response to this RFP acknowledges that all work is to be performed while current activities within these buildings continue or proceed. Contractor will take and include all associated costs for signage, caution tape and safety cones to assure the tenant and public are protected from harm.
ii. All work areas to be properly roped off.
iii. Proceed with installation work only after substrate is prepared, clean, smooth, and dry.
<u>24 Gauge Metal joint cover: At **11** Tilt Wall joints in the wall at the intersection of Roof #1 and Roof #3</u>, the contractor shall furnish and install all necessary materials to perform the following;
    1. Mechanically attach a piece of 24 Ga steel plate over the joints. Fasten the plate to the wall at 12" oc intervals.
    2. The plates shall cover the entire joint, from beneath the roof 1 All Term edge metal, to the Termination of the membrane from Roof #3.
    3. The metal plate shall be back sealed on the wall.
    4. The metal plate shall have a continuous bead of sealant as a top seal on both vertical surfaces.

iv. Proceed with installation work only when weather conditions allow. Follow primary manufacturer's recommendations during application throughout.
v. Contractor agrees to schedule work on individual building / Roof area only after verification that the County does not have any pre-scheduled events and/or conflicts without penalty or cost to the County.
vi. Contractor Project Manager will advise the Member each day on the prior days weather forecast. Each day that the forecast includes a greater than 30% (for that window of time) chance of rain and/or Winds forecast to be in excess of 15-20 mph the contractor will have the option to schedule a "no-work" weather delay day.
vii. Contractor is at all times required to maintain a watertight condition on all buildings being repair / under construction. Contractor and his Insurance Company will be

responsible for any damage to the interior and/or exterior) caused due to negligence on the contractor's part. The contractor agrees to keep all buildings in a watertight condition until such time that the Building/Project ID# has been substantially completed and closeout documents submitted.

viii. COVID-19 / Pandemic: Contractor will adhere to all guidelines, procedures and policies regarding the County's official and published requirements concerning Covid-19 and PPE and include in his/her proposal all necessary costs to comply.

1.2 Scope of work: Contractor shall furnish and install all necessary materials to perform the following:

a. **DEMO:**
   i. Remove the existing single ply roofing membrane, and all related plates / fasteners, down to the respective insulation board. Existing insulation board to remain. Varied thickness; Spray Foam Insulation, ISO insulation and EPS Insulation.
   ii. Remove, for replacement, all exterior edge metal. (See list of location and linear feet of existing coping metal to remove at the end of this Scope of Work, Section 1.1, f.)
   iii. Remove, for replacement, all gutters associated with the roofs under this scope.
   iv. Remove membrane from all walls, exterior, interior, and common walls.
   v. Remove existing membrane from ALL penetrations.

b. **Inspection and Evaluations:**
   i. **Fastener Pull-out Test:** Contractor to verify substrate is clean and dry. Contractor to perform fastener pull test to assure pull out and required spacing for any fasteners.
   ii. Inspect existing insulation for any damage (wet). Provide a square foot cost for replacement of wet / deteriorated insulation, to infill the product removed and bring to existing level height of the surrounding area.

c. **New System:**
   i. Contractors to furnish and install, via Loosely Laid Method, all materials to for ADDITIONAL INSULATION, as described below for each roof section:
      1. **Roof #s 1-7 and 15:**
         a. Add 1.0" Duro-Guard® ISO II - Polyisocyanurate (flat), - **OR** -
         b. Add 1.5" Duro-Guard® EPS Type II (flat)
      2. **Roof #s 8 and 9:**
         a. Add 1.5" Duro-Guard® ISO II - Polyisocyanurate (flat), - **OR** -
         b. Add 2.0" Duro-Guard® EPS Type II (flat)
      3. **Roof #s 10, 13 and 14:**
         a. Add 2.5" Duro-Guard® ISO II - Polyisocyanurate (flat), - **OR** -
         b. Add 3.5" Duro-Guard® EPS Type II (flat)
   ii. Contractor to furnish and install, to the existing crickets, enhancement materials in drain lines as per attached drawings for Roof #s 1, 3, 4, and 6
   iii. Contractor to furnish and install all materials necessary to sump a 4'x4' area at each Primary Scupper.
   iv. Contractor will provide an 8'x8' sump area around each the drain, **high side to match the additional insulation height for the respective roof area, as follows:**
      1. **Roof #s 1-7 and 15:**
         a. ISO Product = High side start = 1", low side finish = .5" – 0"
         b. EPS Product = High side start = 1.5", low side finish = .5"-0"

2. **Roof #s 8 and 9:**
    a. ISO Product = High side start = 1.5", low side finish = .5" – 0"
    b. EPS Product = High side start = 2.0", low side finish = .5"-0"
3. **Roof #s 10, 13 and 14:**
    a. ISO Product = High side start = 2.5", low side finish = .5" – 0"
    b. EPS Product = High side start = 3.5", low side finish = .5"-0"

v. Contractor to "feather in", with additional loose laid ¼" gypsum roof board, any low, ponding areas that exist on roof #s 2 and 7, in an attempt to minimize ponding.

vi. Contractor shall furnish and install all required ½" per foot tapered crickets at the "High" slope sides of Curbed penetrations. Contractor curbed crickets to extend (width) 4" beyond curb width.

vii. Contractor shall furnish and install, via mechanical attachment, a manufacturer's approved ¼" Primed (adhered approved) Gypsum Roof Board (DensDeck, DexCell, Secruck, etc.), over the loose laid insulation, saddles, crickets, and sump materials (stager all joints).

viii. Contractor shall furnish and install, via adhered attachment, an 80 MIL fleeceback over the manufacturer's approved ¼" Gypsum Roof Board using CR 20 adhesive.
1. Contractor will need to protect against using equipment that is soiled in Asphalt during installation of new roof assembly since Asphalt is a contaminate to PVC.
2. Contractor is to refrain from using cords and equipment that may have asphalt residue on it and could contaminate or discolor the new Fully adhered PVC Membrane.
3. Any asphalt residue on the surface of the finished membrane will be required to be removed prior to final inspection.

ix. **Peel Stop Detail**: Contractor shall furnish and install all materials necessary to complete the manufacturer's **Peel Stop Detail**. Detail # AS9060A or #AS9060B

x. **All Walls:**
1. Membrane Attachment to Walls:
    a. Option 1: Contractor shall furnish and install all necessary materials to adhere fleeceback membrane to the existing wall substrate, in accordance with manufacturer's specifications. Water Based Adhesive with Fleeceback membrane has been approved for this application.
    b. Option 2:
        i. Contractor shall furnish and install, via mechanical attachment, a manufacturer's approved ¼" Gypsum Roof Board on the exposed face.
        ii. Contractor shall furnish and install, via adhered attachment, an 80 MIL Bareback membrane with solvent based adhesive.
2. **Exterior Parapet Walls:**
3. Contractor shall furnish and install new nailer (sloped to inside) at the perimeter parapet walls after removal of the membrane. CONTRACTOR TO PROVIDE A LINEAR FOOT COST FOR WOOD NAILER INSTALLATION.
4. Contractor shall furnish and install, ES 1-90 ALL Term 2 Pc Termination metal at the outside, top and vertical surfaces of the parapet walls. See detail #AS 3580

xi. **Interior (Common)Wall:** Contractor shall furnish and install all necessary materials to water proof the walls as follows:

1. Contractor shall furnish and install new nailer (sloped to inside) at the common parapet walls after removal of the membrane. CONTRACTOR TO PROVIDE A LINEAR FOOT COST FOR WOOD NAILER INSTALLATION.
2. Membrane Attachment to Walls: Walls to be fully encapsulated, membrane to be welded to deck membrane on both roof deck surfaces.

xii. **Interior Walls (to upper roof levels) (this includes wall to TPO roof, not on schedule for replacement, and roof #s 8 and 10):** Contractor shall furnish and install all necessary materials to water proof the walls as follows:
1. Termination of membrane shall be with Termination Bar, below the existing metal counter flashing.
2. The Termination bar shall be covered with a metal "Z" flashing attached to the existing metal counter flashing.
3. The contractor shall use stainless-steel metal in locations where stainless-steel metal is existing.

xiii. Terminations with Termination bar on walls shall be done utilizing the 1-3/4" Fascia Bar with Metal cover OR a metal counter flashing. NO EXPOSED TERMINATION BAR.

xiv. **Edges with NO WALLS:** Membrane termination at locations without walls (roll over edges) will be with the Vinyl Coated Metal Drip Edge, as provided by the Manufacture. Installation of all metal edging will be in accordance with the manufacturer's specifications for Adhered applications. (A list of locations and linear feet of such edges can be found at the end of the section, Section 1.1, g)

xv. **Drains / Scuppers / Gutters:** Contractor shall furnish and install all necessary materials to waterproof the Drain, Scuppers, and Gutters in the flowing manner:
1. Drains:
   a. Contractor to include in their proposal to test all drains at start and completion to assure is properly functioning.
   b. See Section 1.1, c, ii-v for requirements for saddles, crickets, and sumps for drains.
   c. All drains shall be water proofed utilizing manufacturer detail #AS2011.
   d. If the existing drain currently has a "Drain boot" installed, the contractor shall furnish and install a new drain clamping ring.
   e. All drains to receive new cast iron strainers (Blue) as manufactured by the primary manufacturer.
2. Scuppers:
   a. Primary - All primary scuppers shall be replaced with Exceptional Metal Vinyl Coated Metal scuppers.
   b. Over-Flow: Waterproof with Membrane scupper materials per manufacturer's specifications.
   c. All existing Metal Scupper wall covers shall remain in place.
3. Gutters and Downspouts: Provide, in the proposal, the cost to replace all gutters and downspouts with new 24 ga steel commercial grade products to match the existing shape and size. (Location and Linear feet of gutter and downspout replacement can be found at the end of this section, Section 1.1, i)

xvi. **Curbed Penetrations (including Mechanical Units):**

1. See cricket requirements in Section 1.1, c, vi for cricket requirements.
2. Membrane Attachment to curbs:
   a. Option 1: Contractor shall furnish and install all necessary materials to adhere an 80 MIL fleeceback membrane to the existing wall substrate, in accordance with manufacturer's specifications. Water Based Adhesive with Fleeceback membrane has been approved for this application.
   b. Option 2:
      i. Contractor shall furnish and install, via mechanical attachment, a manufacturer's approved ¼" Gypsum Roof Board on the exposed face.
      ii. Contractor shall furnish and install, via adhered attachment, an 80 MIL Bareback membrane with solvent based adhesive.
3. Contractor to furnish and install all necessary to water proof / flash curb flashings as follows:
   a. If equipment can be removed and membrane can be placed up and over the top of the curb, adhere membrane and utilize manufacturer's detail #4020. **Any removal of roof top equipment MUST BE PRE-SCHEDULED with the Brazos County representative, a minimum of two weeks in advance.**
   b. If equipment CANNOT be removed, utilize a manufacturer's detail #AS4010 and install new "Z" flashing at all four sides of the curb. Terminate using term bar, top seal, and back seal.
   c. Contractor to furnish and install metal "skirt" flashing to cover all termination bar.
4. At ALL "Goose Neck" Roof Top Vents, the contractor shall furnish and install all materials to perform the following water proofing:
   a. Adhere, with CR-20 HFO adhesive, the 80 MIL fleecback membrane on the flat horizontal surface of the vent. Membrane should be adhered from horizontal to vertical transition on both sides.
   b. Weld an 80 MIL Bareback membrane to the horizontal adhered membrane, turn the bareback membrane over the transition, down, and onto the vertical surface of the vent, 6".
   c. Terminate the barback membrane on the vertical surface with 1-3/4" Fascia Bar with metal cover. Contractor shall take care NOT to impede the mechanical operation of the vent doors.
   d. The membrane shall be welded to the curb membrane at the bottom of the vent.

xvii. **Round Penetrations Flashings:**

1. Contractor shall furnish and install all materials necessary to raise all round penetrations to a minimum of 8" above roof line.
2. Contractor shall furnish and install split boots and flashings at all non-curbed penetrations to assure each fit snug and tight around the shaft of the penetration. Termination to include Panduit band top seal and back seal. All pipe boots must fit snug to the shaft of the plumbing boot at the base and up to the top of the flashing. No witches' hats or loose-fitting flashings permitted.

xviii. **Guy Wires:** At all Guy Wire attachments, the contractor shall furnish and install the appropriate Anchor-Tite non-penetrating anchors for the attachment of the Guy Wire.

xix. **Walk Pads:** Contractor is to include, in their proposal, the installation of Manufacturer walk pads at the following locations:
1. At locations where walk / service pads exist currently.
2. All service sides of Mechanical Units and Stairwell Access.
3. Contractor SHALL NOT install walk pad over any field membrane laps. Contractor will cut walk pad and install on either side when this condition exists as required.

xx. **Wood Blocking** for Roof Top Units: Contractor to furnish and install all necessary materials to waterproof all wood blocking, as follows:
1. Provide 4x4 treated wood blocking.
2. Encapsulate all wood blocking with PVC membrane.
3. **Warranty Signage**: Contractor will post a sign at the Hatch access or in location of the County choosing to notify anyone who access the roof the Date Installed, Manufacturer, Contractor name and phone number, Manufacturer warranty period and assembly installed.

d. **Non-Duro-Last Items:**
i. Lightning Protection: Contractor shall provide, in their proposal, the cost associated with removal, reinstallation, and 5-year State certification for all lightning protection associated with the project. (Location and linear feet of existing Lightning Protection can be found at the end of this section, Section 1.1, h)
ii. Conduit and Supports:
1. Contractor to clean and paint (2 coats) all existing gas lines. Fire Code color designations include the following; ((yellow), Electrical Lines (red) and water / Condensate lines (blue)).
2. Contractor to install new Pyramid locking supports, where current supports are missing, damaged, or in disrepair. Supports to be compatible with PVC membrane and Manufacturer. Supports to be installed. 8' o.c.
iii. New Flue Vent Tops and Rain Collars: Replace flue vent tops, rain collars, and round curb exhaust vent tops that are exposed and damaged from Hail Exposure per itemized list provided by the roof consultant.

e. **Warranty:**
i. Contractor Warranty: Provide Contractors 5-Yeat Contractors Warranty
ii. Manufacture Warranty: Provide 20-year "No Dollar Limit" Guaranty.

f. Location and Linear Feet of Existing Coping Metal that is scheduled for removal and replacement with 2 Pc. All Term Metal Edging (as defined by Roof Consultant):

i. Northwest (Upper Roof) #1	625.85 l.f.
ii. Northwest (Lower Roof) #2	107.83 l.f.
iii. Northeast Roof Area #3	610.22 l.f.
iv. Southwest (Main Roof) Area #4	1600.70 l.f.
v. Kitchen Penthouse Area #5	000.00 l.f.
vi. New (Lower) Section 1 Area #6	99.83 l.f.
vii. New (Lower) – Visitation Area- #7	32.88 l.f.
viii. East Center (Visitation) #8	000.00 l.f.
ix. East Center (Trustee Area) #9	218.47 l.f.
x. Southeast (Offices) Area #10	200.00 l.f.
xi. West Hall Area #13	76.95 l.f.
xii. East Hall Area #14	000.00 l.f.
xiii. Portico -Entry Area #15	53.49 l.f.
Total Coping	**3,626.22 l.f.**

g. Location and Linear Feet of Existing roll over edges that are scheduled for the installation of the Vinyl Coated Metal Drip Edge, Metal Edging (as defined by Roof Consultant):

i. Northwest (Upper Roof) #1	000.00 l.f.
ii. Northwest (Lower Roof) #2	000.00 l.f.
iii. Northeast Roof #3	000.00 l.f.
iv. Southwest (Main Roof) #4	000.00 l.f.
v. Kitchen Penthouse #5	102.33 l.f.
vi. New (Lower) Section #1 Area #6	28.51 l.f.
vii. New (Lower) Roof Area #7	24.00 l.f.
viii. East Center (Visitation) #8	233.33 l.f.
ix. East Center (Trustee Area) #9	233.33 l.f.
x. Southeast (Offices) #10	501.82 l.f.
xi. West Hall #13	88.00 l.f.
xii. East Hall #14	000.00 l.f.
xiii. Portico -Entry #15	000.00 l.f.
Total Roof Edge:	**1,211.32 l.f.**

h. Location and Linear Feet of Existing Lightning Protection (as defined by Roof Consultant) :

i. Northwest (Upper Roof) #1	762.85 l.f.
ii. Northwest (Lower Roof) #2	99.83 l.f.
iii. Northeast Roof #3	1,220.43 l.f.
iv. Southwest (Main Roof) #4	2,200.87 l.f.
v. Kitchen Penthouse #5	50.00 l.f.
vi. New (Lower) Section #1 Area #6	000.00l.f.
vii. New (Lower) Roof Area #7	000.00 l.f.

viii.	East Center (Visitation) #8	000.00 l.f.
ix.	Southeast (Offices) #10	000.00 l.f.
x.	West Hall	000.00 l.f.
xi.	East Hall	000.00 l.f.
xii.	Portico -Entry	408.00 l.f.
	Total Lightning Protection:	**4,333.98 l.f**

i. Location and Linear Feet of Gutters and Downspouts (as defined by Roof Consultant):

i.	Northwest (Upper Roof) #1	625.85 l.f.
ii.	Northwest (Lower Roof) #2	107.83 l.f.
iii.	Northeast Roof Area #3	610.22 l.f.
iv.	Southwest (Main Roof) Area #4	1600.70 l.f.
v.	Kitchen Penthouse Area #5	000.00 l.f.
vi.	New (Lower) Section 1 Area #6	99.83 l.f.
vii.	New (Lower) – Visitation Area- #7	32.88 l.f.
viii.	East Center (Visitation) #8	000.00 l.f.
ix.	East Center (Trustee Area) #9	218.47 l.f.
x.	Southeast (Offices) Area #10	200.00 l.f.
xi.	West Hall Area #13	76.95 l.f.
xii.	East Hall Area #14	000.00 l.f.
xiii.	Portico -Entry Area #15	53.49 l.f.
xiv.	Ribbed Metal Roof Area #16	216 l.f.
	Total Coping	**3,626.22 l.f.**

1.3 SECTION INCLUDES

A. Duro-Last® Duro-Fleece™ membrane adhered with Duro-Fleece CR-20 membrane adhesive, splatter applied.

B. DensDeck® Prime Roof Board, attached with mechanical fasteners.

C. Duro-Guard® EPS Type II (flat), loosely laid.

D. Duro-Guard® ISO II (flat), attached with mechanical fasteners.

E. Prefabricated flashings, corners, parapets, stacks, vents, and related details.

F. Fasteners, adhesives, and other accessories required for a complete roofing installation.

G. Traffic Protection.

1.4 REFERENCES

A. NRCA - The NRCA Roofing and Waterproofing Manual.

B. ASCE 7 - Minimum Design Loads For Buildings And Other Structures.

C. UL - Roofing Materials and Systems Directory, Roofing Systems (TGFU.R10128).

D. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

E. ASTM D 751 - Standard Test Methods for Coated Fabrics.

F. ASTM D 4434 - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.

G. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.

H. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.5 SYSTEM DESCRIPTION

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. During installation contractor will install night seals to assure the building remains watertight throughout the installation of the roof system.

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

D. Physical Properties:

1. Roof product must meet the requirements of Type III PVC sheet roofing as defined by ASTM D 4434 and must meet or exceed the following physical properties.

2. Thickness: 80 mil (101 mil including fleece), nominal, in accordance with ASTM D 751.

3. Thickness Over Scrim: ≥ 41 mil in accordance with ASTM D 7635.

4. Breaking Strengths: ≥ 545 lbf. (MD) and ≥ 376 lbf. (XMD) in accordance with ASTM D 751, Grab Method.
5. Elongation at Break: ≥ 34% (MD) and ≥ 33% (XMD) in accordance with ASTM D 751, Grab Method.
6. Tearing Strength: ≥ 70 lbf. (MD) and ≥ 211 lbf. (XMD) in accordance with ASTM D 751, Procedure B.
7. Low Temperature Bend (Flexibility): Pass at -40 °F in accordance with ASTM D 2136.
8. Linear Dimensional Change: ≤ 0.10% (MD) and 0.10% (XMD) in accordance with ASTM D 1204 at 176 ± 2 °F for 6 hours.
9. Water Absorption: ≤ 0.1% in accordance with ASTM D 570 at 158 °F for 166 hours.
10. Static Puncture Resistance: ≥ 33 lbs. in accordance with ASTM D 5602.
11. Dynamic Puncture Resistance: ≥ 14.7 ft-lbf. in accordance with ASTM D 5635.

E. Cool Roof Rating Council (CRRC):
   1. Membrane must be listed on CRRC website.
      a. Initial Solar Reflectance: ≥ 87%
      b. Initial Solar Reflective Index (SRI): ≥ 110

F. Insulation
   1. Leave in place and reuse in the new system, the existing insulation, ISO, Spray Foam, and EPS insulation.
   2. Additional ISO or EPS insulation as required to achieve an R-Value: 25 system.
   3. Install using a minimum of two layers.
   4. ¼" DensDeck® Prime Roof Board, OR manufacturer's approved equivalent, attached with mechanical fasteners.

1.6 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Project Team Contact Sheet with both phone number and emails.

C. Duro-Last data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.

D. Application guidelines for the specific assembly being installed.

E. Shop Drawings:

a. Indicate insulation pattern, overall membrane layout, field seam locations, joint or termination detail conditions, and location of fasteners.

b. Pull test results and required attachment based on results.

F. Verification Samples: For each product specified, two samples, representing actual product, color, and finish.

1. 4 inch by 6 inch sample of roofing membrane, of color specified.
2. 4 inch by 6 inch sample of walkway pad.
3. 4" x 6" Sample of ISO and EPS Insulation
4. 4" x 6" sample of Primed Dens Deck.
5. Submit PDF of all Counterflashing skirting to be installed at Mechanical units including gauge and profile.
6. Termination bar, fascia bar with cover, drip edge and gravel stop if to be used.
7. Each fastener type to be used for installing membrane, insulation/recover board, termination bar and edge details.

G. Product Data Sheets for ALL materials schedules for use on this project.

H. MSDS: Contractor to submit copies of all Material Safety Data sheets and maintain one bound copy on site throughout the execution of the scope of work.

I. Field Drawings: Contractor to submit all manufacturer and/or field drawings for details to be used in the execution of this work.

J. Contractor to submit PDF of all wood components to be used on execution of this work.

K. Contractor to submit PDF and profile drawing for any Metal deck replacement.

L. Installer Certification: Certification from the roofing system manufacturer that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

M. Submit Manufacturer Guaranty (sample)-Warranty to include all membrane wall flashings, curb flashings, scuppers, downspouts, and perimeter metal termination metal.

N. Submit Contractors 5-Year Warranty (sample)

1.7 QUALITY ASSURANCE

A. Owners' consultant will inspect all work a minimum of once per week during the execution of the repairs. Contractor to correct all deficiencies noted during inspection prior to following week inspection.

B. Perform work in accordance with manufacturer's installation instructions.

C. Manufacturer Qualifications: A manufacturer specializing in the production of PVC membranes systems and utilizing a Quality Control Manual during the production of the membrane roofing system that has been approved by and is inspected by Underwriters

Laboratories. A manufacturer is primary (not a toll manufacture) specializing in the production of PVC membranes systems. Maintains an Auditing process including inspection of all warrantied roof before issuance of said warranty. Has registered it products and is listed with both Factory Mutual and UL and has produce these product in excess of 10 years.

D. Installer Qualifications: Company specializing in installation of roofing systems similar to those specified in this project and approved by the roofing system manufacturer. Contractor must be Certified with the Manufacturer, be able to issue Manufacturer "NDL" Warranty, Capable of issuing a Payment and performance bond and has a minimum of 10 years install (successively) specified system/assembly. Note: See additional contractor requirement within the RFP requirements.

E. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.

F. There shall be no deviations from the roof membrane manufacturer's specifications or the approved shop drawings without the prior written approval of the manufacturer. NRCA guidelines will be followed as a minimum.

G. Contractor to submit copies of all Manufacturer inspections (following week) to Owner and 4T Partnership.

1.8 REGULATORY REQUIREMENTS

A. Conform to applicable code for roof assembly wind uplift and fire hazard requirements.

B. Fire Exposure: Provide membrane roofing materials with the following fire-test-response characteristics. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure:

a. Class A; ASTM E 108, for application and roof slopes indicated.

2. Fire-Resistance Ratings: Comply with ASTM E 119 for fire-resistance-rated roof assemblies of which roofing system is a part.

3. Conform to applicable code for roof assembly fire hazard requirements.

C. Wind Uplift:

1. Roofing System Design: Provide a roofing system designed to resist uplift pressures calculated according to the current edition of the ASCE-7 Specification *Minimum Design Loads for Buildings And Other Structures.*

2. All installations to meet or exceed a Factory Mutual FM 1-90 minimum. (this not an FM insured Building)

1.9 PRE-INSTALLATION MEETING

A. Convene meeting not less than two weeks prior to planned or scheduled work of this section.

B. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following.

1. Pre-Construction Meeting; Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Contractor to provide three copies of all MSDS Sheets.
4. Contractor to submit all submittals no less than one week prior to pre-construction meeting.
5. Contractor to furnish/submit a list of all Sub-Contractors and Contacts.
6. Contractor to provide/submit a Project Contact list at the pre-con.
7. Contractor to provide/submit an Occupant notification sheet on letter head with contact numbers to advise public and occupant of upcoming construction and dates for work.
8. Review with site personnel all required access, special requirements, exit and shut down of activities daily.
9. Verify location of staging area.
10. Verify the location of Contractor access on to the roof and existing.
11. Discuss and review all safety requirements.
12. Discuss all loading of materials and securement of materials on roof and in staging area throughout project.
13. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
14. Review structural loading limitations of roof deck during and after roofing.
15. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
16. Review governing regulations and requirements for insurance and certificates if applicable.
17. Review temporary protection requirements for roofing system during and after installation.
18. Review roof observation and repair procedures after roofing installation.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Store roof materials and place equipment in a manner to avoid permanent deflection of deck.

E. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.11 WARRANTY

A. Contractor's Warranty: The contractor shall warrant the roof application with respect to workmanship and proper application for Five (5) years from the effective date of the warranty issued by the manufacturer.

B. Manufacturer's Warranty: Must be no-dollar limit type and provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition the warranty must meet the following criteria:

1. Warranty Period: 20 years from date issued by the manufacturer.
2. No exclusions for ponding water.
3. Must provide positive drainage.
4. No exclusion for damage caused by biological growth.
5. Warranty shall not place excessive requirements on Owner to maintain Manufacturer Warranty.
6. Acts of God, Vandalism to be excluded.
7. Issued direct from and serviced by the roof membrane manufacturer.
8. Transferable for the full term of the warranty.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: Duro-Last Roofing, Inc., which is located at: 525 Morley Drive, Saginaw, MI 48601. Telephone: 800-248-0280.

B. All roofing system components to be provided or approved by Duro-Last Roofing, Inc.

C. Substitutions: Not permitted.

2.2 ROOFING SYSTEM COMPONENTS

A. Roofing Membrane: Duro-Last® Duro-Fleece™ membrane conforming to ASTM D 4434, type III, fabric-reinforced, PVC, NSF/ANSI 347 Gold or Platinum Certification, and a product-specific third-party verified Environmental Product Declaration. Membrane properties as follows:

1. Thickness:
    a. 80 mil nominal (88 mil including fleece).
    a. Exposed Face Color: White.
2. Minimum recycle content 7% post-industrial and 0% post-consumer.
3. Recycled at end of life into resilient flooring or concrete expansion joints.

B. Accessory Materials: Provide accessory materials supplied by or approved for use by Duro-Last Roofing, Inc.

    a. Sheet Flashing: Manufacturer's standard reinforced PVC sheet flashing.
        i. Duro-Last Factory Prefabricated Flashings: manufactured using Manufacturer's standard reinforced PVC membrane.
        ii. Stack Flashings. (Split Boot ONLY)
        iii. Curb Flashings.
        iv. Inside and Outside Corners.
    b. Sealants and Adhesives: Compatible with roofing system and supplied by Duro-Last Roofing, Inc.
        i. Duro-Fleece® CR-20 Membrane Adhesive. (Field Membrane. Optional for walls and curbs)
        ii. DURO-LAST SOLVENT-GRIP® SPRAY ADHESIVE (Option for walls and curbs)
        iii. Water Based adhesive (Option for walls and curbs)
        iv. Duro-Caulk® Plus. (back and top seals)
        v. Strip Mastic. (back seals)
    c. Metal Edge Products – 24 ga – Galvalume – Mill or Kynar finish (Edge Base and Cover metals, gutters, downspouts, etc.)
    d. Anchor Products (Non-Penetrating anchors for Guy wires)
    e. Fasteners and Plates: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane and insulation to substrate. Supplied by Duro-Last Roofing, Inc.
        i. #14 Heavy Duty Fasteners.
        ii. 3 inch Metal Plates.
    f. Termination and Edge Details: Supplied by Duro-Last Roofing, Inc. – 24 ga – Galvalume – Mill or Kynar finish

i. Termination Bar.

ii. All Term™.

iii. Kynar Steel Fascia Cover.Vinyl Coated Metal: Supplied by Duro-Last Roofing, Inc. 24 gauge, hot-dipped galvanized, grade 90 metal with a minimum of 17 mil of Duro-Last membrane laminated to one side. Vinyl Coated Metal Products (drip edge metal, pitch pans, scuppers, etc.)

C. Substrate Board:

a. Glass-mat-faced, water-resistant gypsum substrate conforming to ASTM C 1177/C 1177M, DensDeck® Prime Roof Board as manufactured by Georgia-Pacific Corporation, OR manufacturer's approved equivalent.

b. ¼ inch thick

D. Walkways:

a. Provide non-skid, maintenance-free walkway pads in areas of heavy foot traffic and around mechanical equipment.

b. Duro-Last Roof Trak® III Walkway Pad.

2.3 ROOF INSULATION

A. General:

1. Provide preformed roof insulation boards that comply with requirements and referenced standards, as selected from manufacturer's standard sizes. (Thickness and Type as directed by the Scope of Work for this project, Section 1.1)

2. Provide preformed saddles, crickets, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

B. Polyisocyanurate Board Insulation: Complying with ASTM C 1289, Type II, felt or glass-fiber mat facer on both major surfaces. Material as supplied by Duro-Last.

1. Duro-Guard® ISO II (flat).

C. Expanded Polystyrene (EPS) Board Insulation: Material as supplied by Duro-Last.

1. Duro-Guard® EPS Type II (flat).

2.4 ROOF INSULATION ACCESSORIES

A. General: Provide roof insulation accessories approved by the roof membrane manufacturer and as recommended by insulation manufacturer for the intended use.

B. Fasteners: Provide Duro-Last factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening insulation and/or insulation cover boards in conformance to specified design requirements.

C. Insulation Cover Board:

1. Glass-mat-faced, water-resistant gypsum substrate conforming to ASTM C 1177/C 1177M, DensDeck® Prime Roof Board, OR manufacturer's approved equivalent.

2. ¼ inch thick.

3. Fastened in accordance with FM 1-90

PART 3 EXECUTION

3.1 EXAMINATION

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

B. Replace any wet ISO found and document. Report each/any to Owner/Consultant.

C. Verify that the deck is supported and secured.

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

E. Verify that the deck surfaces are dry and free of standing water, ice or snow.

F. Verify that all roof openings or penetrations through the roof are solidly set.

G. If substrate preparation is the responsibility of another contractor, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Remove all debris and any residual moisture on membrane prior to membrane removal.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

D. Surfaces shall be clean, smooth, free of fins, sharp edges, loose and foreign material, oil, grease, and bitumen.

3.3 INSTALLATION

A. Install insulation in accordance with the roof manufacturer's requirements.

B. Follow all manufacture's and industry guidelines when installing tapered insulation products

C. Insulation: Duro-Guard® ISO II (flat) OR Duro-Guard® EPS Type II (flat).

1. Install insulation in accordance with the roof manufacturer's requirements.
2. Insulation shall be adequately supported to sustain normal foot traffic without damage.
3. Where field trimmed, insulation shall be fitted tightly around roof protrusions with no gaps greater than ¼ inch.
4. No more insulation shall be applied than can be covered with the roof membrane by the end of the day or the onset of inclement weather.
5. If more than one layer of insulation is used, all joints between subsequent layers shall be offset by at least 6 inches.
6. Mechanical Attachment: Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet applicable

design requirements. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed must be replaced or corrected.

D. Insulation Cover Board: DensDeck® Prime Roof Board.
   1. Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet applicable design requirements.
      a. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed must be replaced or corrected.
      b. Attach boards in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.
      c. At gutters and drip edge / rake conditions tapper the last 4' of insulation to assist with drainage. ¼" to 0"

E. Roof Membrane: 80 mil, Duro-Last® Duro-Fleece™ membrane.
   1. Roof membrane should be unrolled and allowed to relax prior to installation.
   2. Use only membrane adhesive (CR-20 HFO) acceptable to the roof manufacturer's that meets the applicable design requirements.
   3. Curbs and Walls: Install utilizing one of the Options provided in the Scope of Work, section 1.1.
   4. Cut membrane to fit neatly around all penetrations and roof projections.
   5. Unroll roofing membrane and positioned with a minimum 6 inch overlap along the selvage edge. Roll ends must be butted together and membrane of the same mil thickness, without fleece backing, must be used to form the end lap.
   6. Apply adhesive in accordance with the roof manufacturer's requirements.
   7. Apply adhesive in splatter pattern.
   8. Follow guidelines outlined in the adhesive's Product Data Sheet.
   9. Read the adhesive's Material Safety Data Sheet (MSDS) prior to using the adhesive.

F. Seaming:
   1. Weld overlapping sheets together using hot air. Minimum weld width is 1-1/2 inches.
   2. Check field welded seams for continuity and integrity and repair all imperfections by the end of each work day.
   3. Any wrinkles or non-uniform laps shall be cut or patched.

G. Membrane Termination/Securement: All membrane terminations shall be completed in accordance with the membrane manufacturer's requirements.
   1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
   2. Provide securement at any angle change where the slope or combined slopes exceeds two inches in one horizontal foot.

3. Any exposed term bar is to receive metal cover.

H. Flashings: Complete all flashings and terminations as indicated on the drawings and in accordance with the membrane manufacturer's requirements.

1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.

   a. Do not apply flashing over existing thru-wall flashings or weep holes.

   b. Secure flashing on a vertical surface before the seam between the flashing and the main roof sheet is completed.

   c. Extend flashing membrane a minimum of 6 inches (152 mm) onto the main roof sheet beyond the mechanical securement.

   d. Use care to ensure that the flashing does not bridge locations where there is a change in direction (e.g. where the parapet meets the roof deck).

2. Penetrations:

   a. Flash all pipes, supports, soil stacks, cold vents, and other penetrations passing through the roofing membrane as indicated on the Drawings and in accordance with the membrane manufacturer's requirements.

   b. Utilize custom prefabricated flashings supplied by the membrane manufacturer.

   c. Existing Flashings: Remove when necessary to allow new flashing to terminate directly to the penetration.

   d. All plumbing stacks to receive properly sized "Split" boots and fit snug from field to top of shaft.

3. Pipe Clusters and Unusual Shapes:

   a. Clusters of pipes or other penetrations which cannot be sealed with prefabricated membrane flashings shall be sealed by surrounding them with a prefabricated vinyl-coated metal pitch pan and sealant supplied by the membrane manufacturer.

   b. Vinyl-coated metal pitch pans shall be installed, flashed and filled with sealant in accordance with the membrane manufacturer's requirements.

   c. Pitch pans shall not be used where prefabricated or field fabricated flashings are possible.

I. Roof Drains:

1. Coordinate installation of roof drains and vents specified in Section 15146 - Plumbing Specialties.

2. Remove existing flashing and asphalt at existing drains in preparation for sealant and membrane.

3. Provide a smooth clean surface on the mating surface between the clamping ring and the drain base.

J. Edge Details:

1. Provide edge details as indicated on the Drawings. Install in accordance with the

membrane manufacturer's requirements.

2. Join individual sections in accordance with the membrane manufacturer's requirements.
3. Coordinate installation of metal flashing and counter flashing specified in Section 07620.
4. Manufactured Roof Specialties: Coordinate installation of copings, counter flashing systems, gutters, downspouts, and roof expansion assemblies specified in Section 07710.

K. Walkways:

1. No walkway / service pad may be installed over field or flashing laps.
2. Install walkways in accordance with the membrane manufacturer's requirements.
3. Provide walkways where indicated on the Drawings.
4. Install walkway pads at roof hatches, access doors, rooftop ladders and all other traffic concentration points regardless of traffic frequency. Provided in areas receiving regular traffic to service rooftop units or where a passageway over the surface is required.
5. Do not install walkways over flashings or field seams until manufacturer's warranty inspection has been completed.

L. Water cut-offs / Night seals required at the conclusion of each crew day:

1. Provide water cut-offs on a daily basis at the completion of work and at the onset of inclement weather.
2. Provide water cut-offs to ensure that water does not flow beneath the completed sections of the new roofing system.
3. Remove water cut-offs prior to the resumption of work.
4. The integrity of the water cut-off is the sole responsibility of the roofing contractor.
5. Any membrane contaminated by the cut-off material shall be cleaned or removed.

3.4 FIELD QUALITY CONTROL

A. Interim Site inspection a manufacturer's representative shall be performed on a weekly basis.

B. A report of all the inspections shall be forwarded to the Consultant within 48 business hours.

C. Contractor will correct all deficiencies, noted in the inspection, before following week's inspection.

D. The membrane manufacturer's representative shall provide a comprehensive final inspection after completion of the roof system. All application errors shall be addressed and final punch list completed.

E. A Final inspection, to include the Owner's Representative, Consultant, and Contractor, will not be scheduled until the contractor has confirmed the Manufacturer's inspection

and issuance of the warranty (20 Year NDL Guaranty) has been completed.

F. Upon receipt or confirmation of Manufacturer's successful completion and issuing of the NDL Warranty, the Contractor will schedule with a Final Walk-through and inspection with the Owner's representative and consultant. Any defects noted in the final walk-through and inspection will be repaired by the contractor, within 5 business days. If the Owner's representative so desires, the Consultant can perform a follow-up final inspection. Any cost for a required third inspection would be at the cost of the Contractor.

3.5 PROTECTION

A. Protect installed roofing products from construction operations until completion of project.

B. Contractor will remove any foreign products from surface of membrane prior to final inspection. Any foreign products documented on or under the surface will be required to be removed prior to closeout.

C. Contractor will be responsible for cleaning any membrane that is marked or damaged by foreign material spillage or otherwise. Contractor may at his own cost be required to wash the service of the membrane should this be identified or marked during the final inspection.

D. Contractor shall clean/remove all asphalts, rubber tire or other marks from the finished membrane prior to closeout. All adhesive or caulk shall also be removed prior to acceptance.

E. Where traffic is anticipated over completed roofing membrane, protect from damage using durable materials that are compatible with membrane.

END OF SECTION

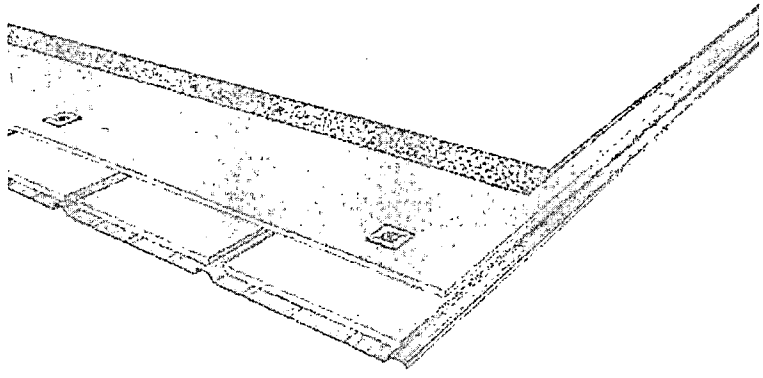
Brazos County Detention Center

1835 Sandy Point Rd
Bryan, TX 77807

Metal Roofs - #12E-12I

Prepared For: Chenelle Plyler
Duro-Last Roofing, Inc

Prepared By: James Griffin
Duro-Last Roofing, Inc



Duro-Last Roof Assembly Description

- **New Roof System:**
  - **Duro-Last® Duro-Fleece™ membrane**
    - Membrane Thickness: 80 mil nominal (88 mil including fleece)
    - Color: White
    - Attachment: Adhered with Duro-Fleece CR-20 membrane adhesive, splatter applied
- **DensDeck® (OR Manufacturer's Approved Equivalent) Prime Roof Board**
  - Thickness: ¼ inch
  - Attachment: Attached with mechanical fasteners
- **Duro-Guard® Type VIII EPS (Flute Filler)** - Attachment: Loosely laid
- **Existing Roof System: Metal Roof**

PART 1 GENERAL

1.1 SITE GUIDELINES

a. **Contractor Execution:**
   i. **Contractor Proposal Form:** Contractor to submit RFP proposal response on RFP Proposal response form. No other forms will be accepted.
   ii. **Background Information**: Contractor will supply all required background information required to comply with Brazos County requirements.
   iii. **Insurance**: Contractor will submit proof of insurance (Certificate of Insurance) showing coverage that meets or exceeds all county requirements.
   iv. **Permit Fee(s):** Contractor will include any Permit costs and will include any administration cost for submitting and/for filing for a permit, should a permit be required. The contractor will include all costs for submitting for permit and any cost to collect the permit and post the permit at the appropriate locations.
   v. **Pre-Construction Meeting:** Prior to the execution contractor will attend a Pre-Construction meeting (Contractor Project Manager, Superintendent, Manufacturer Representative, Owner and Consultant) to review execution, scheduling, and general guidelines for the project. Contractor will submit submittals (PDF, Application Guidelines, Field Drawings, Warranties, Guaranties) prior to the Pre-Construction meeting for all required products and MSDS sheets. Contractor to provide a Project Contact Sheet with names, cell phones and email for all personnel to be involved with scope of work. (Project Manager, Site Project Manager, Crew Superintendent and Office Contact) Contractor should submit a soft copy of these documents no later than 10 days prior to this meeting.
   vi. **Site/ Project Manager:** Contractor to provide and maintain a minimum of one (1) non-working Project Manager to oversee operations, safety compliance and coordination with site personnel. Project Manager will report to Owner/Site Representative a minimum of once each morning and once each afternoon to assure site personnel are advised on all areas that construction activity will be taking place, coordination of any lifting activities and verify any areas of possible moisture entry from prior night or day.
   vii. **Project Team Contact Sheet**: Contractor to provide an emergency contact sheet with email and cell phone contact numbers for all key personnel. Contractor to bring to Pre-Construction meeting.
   viii. **Site Security:** Contractor to include all cost to comply with Brazos County Detention Center requirements. This is a secure facility with multi-roof areas and will require close coordination with Detention Center personnel.
   ix. **Occupant Notification**: Contractor to post 8 ½ x 11" Notification at access / entry doors and exits notifying public and occupant of work currently active on at this site.
   x. **Staging area:** Contractor will maintain a single designated staging area. All material storage, equipment storage is required to be kept at staging unless in use. All breaks, lunches, and safety meetings to be held in staging area at all times, unless authorized and identified with the Pre-Construction minutes. Contractor will stage equipment, material, and Company/ Crew vehicles in the assigned staging area location. Contractor will maintain a Porta John and wash area within the area. Staging area should be marked with safety cones and caution tape to help prevent accidental access by the public.
   xi. **Storage:** Contractor is responsible for assuring that all material is secure on the roof and ground. All trash and debris should be bagged on a regular basis. Site should be

free of wind-blown wrappers, trash, or debris. Contractor will maintain surrounding grounds with no debris, wrappers, water bottles etc. Contractor will bag all debris unless using a Skytrac and box for debris. At no time may contractor throw or discharge any materials or debris from roof. **This is a two-story building making it even more important that all material and equipment be away from the building edge.**

xii. **Signage**: Contractor will post one sign at the staging area identifying the site is an active construction site. Signage should include Company name, Office contact (Phone and Email) Site Project Manager name and phone number.

xiii. **Ground Protection**: Contractor will mark with cones on the ground whenever working within 10' of the perimeter over doors, exits and vehicle garage doors.

xiv. **Rain & Weather**: Contractor will have personnel on site or within 15-30 min. from the job site 7 days a week and including Holidays until substantially complete. At any time that the building is exposed to weather (Rain, Wind or Other) Contractor will meet Owner representative to assure all water tie offs are in place and to assure there is no moisture entry into the building. Contractor is responsible for keeping the building in a watertight condition from start of construction until complete. If crew or personnel dispatch for holidays or weekends contractor is required to maintain a minimum of two personnel 15-mile radius to respond, should it rain and to daily inspect of staging area, inspection of roof loaded material and to inspect all water tie offs a minimum of twice daily on non-workdays.

xv. **Site Safety**: Contractor will adhere to all safety requirements while performing work on the site. This will include but not limited to the following:

1. Compliance with all OSHA requirements -See attached OSHA Bulletin-Roofing
2. Compliance with all County requirements
3. Contractor will maintain a clean and orderly staging area throughout execution. Staging area will include a porta john and be clearly marked with cones and caution tape. The area is to be clearly marked to avoid any accidental entry by the public. Contractor will maintain all crew trucks, lifting equipment, ext. in this area.
4. Lifting Equipment will always be stored in staging if not being used. Contractor will protect all parking lot surfaces with plywood to prevent any dripping of hydraulic oil or other. Contractor will chain the wheel to the axle when not in use. Contractor will provide a copy of the key or passcode to equipment. Contractor will avoid creating ruts or damage to the surrounding areas, buildings and/or land scape. Any signs of leaking or significant issues with Hydraulic equipment contractor will immediately switch out equipment and do so without interruption to the work.
5. Contractor will always maintain a fire Extinguisher in the staging area and at the roof where any gas filled generators are in use.
6. Contractor will install all required warning lines and fall protection as required throughout the execution of the work to protect the public and county personnel while on site performing repairs.
7. Contractor will provide their own access to and from the roof. Contractor crew is to refrain from entry, interior roof hatch or exit of the building. Only the Project Manager and Crew Superintendent shall access or traffic the building and only with an approved County escort.
8. Contractor will install safety cones along sidewalk leading up to all primary entrances and exits that are to remain open during repairs / construction.
9. Contractor will comply with all required work hours and special designated days by the county. Contractor should include and anticipate any costs associated with

overtime and night or weekend work to complete this project. No change orders for overtime, weekend or night work will be permitted.

10. Contractor and crew will comply with all Covid-19 rules and procedures while on site performing work.
11. Contractor and crew will refrain from any smoking on site. Contractor, Crew and Contractor vehicles will refrain from any drug or illegal substances on person or use while performing work. No alcohol or other on site whether containers are empty or full. This includes person and/or vehicles.
12. **Crew Safety Vests:** All Contractor personnel on site will wear safety vest to allow ease of identification for building personnel and public. Contractor Crew Superintendent and Project Manager will wear a different colored safety vest for ease of identification of Owner Personnel and the Public.
13. **Safety Spotter:** Contractor will provide spotter personnel at the front and rear of any lifting equipment when equipment is be moved outside of staging area to assure that no public property or personnel can be damaged or hurt during operation. Contractor will also utilize a spotter any time the crew may be working within 10'-15' of the perimeter of the roof. Should the contractor be required to expose the roof to below to occupant or public. (i.e., Skylights) Contractor will coordinate with County with County contact for coordination of the Area being exposed. Any such type of area should also be marked with cones to prevent the public from accidently walking into this area.

xvi. **Roof Access:** Contractor will provide their own exterior access to the building. All access points are to be removed when contractor is not on site or construction activity is not in process. Anyone accessing through the building must comply with all COVID-19 and CDC Guidelines. Contractor personnel will perform temperature checks each day and document each crew member result.

xvii. **Electrical Power:** Contractor will supply all the contractor required power for operation of equipment. Contractor is not allowed at any time to use Owners water, electrical receptacle or other in execution of this scope of work.

xviii. **Reconnect/ Disconnect:** Contractor is not authorized or allowed to disconnect any Mechanical units on the building. If for any reason the contractor feels it is necessary to disconnect a mechanical unit this must be approved in advance and scheduled with the Owner.

b. **CLOSEOUT DOCUMENTS & PAYMENT PROCESSING:** Contractor will submit a single and final invoice upon completion of the repairs for **Brazos County Roof Repair s- Brazos County Detention Center** to include the following:

i. **Contractor Warranty:** Contractor will provide the Contractor 5-year workmanship warranty for all work performed.

ii. **Final Inspection** 4T Partnership will schedule an inspection with the Contractor and the Owner/County to perform a walk through and inspection of the completed Roof assembly and all areas included in the contractor's scope of work. 4T Partnership will forward minutes and documentation of any items in need of correction or repair. Any punch items will be corrected during inspection or can be performed, and contractor can submit photos showing corrective action.

iii. **Contractor Invoice** – Contractor will submit a Final invoice with confirmation of completion of all punch list items and reference RFP III and building name with address.

iv. **Manufacturer "No Dollar Limit Guaranty_–** Contractor will submit a copy and provide the Owner with an original of the required 20-year NDL Guaranty. The Guaranty should reference the Correct Owner / Member Name, Building Address and include execution by the Manufacturer appropriate representative.

v. **"Conditional" Lien Release-** Contractor will submit a "Conditional Lien: Release with closeout documents including separate releases for any listed sub-contractors.

vi. **Performance & Payment Bond-** Contractor will submit a copy of the Payment & Performance bond.

vii. **Punch List Items Documentation-** Contractor will provide any necessary punch list / corrective action list and documentation showing each correction if required after the final inspection.

viii. **Brazos County Purchasing Documents**: Please Brazos County Purchasing requirements for any additional closeout documents.

c. **DELIVERY, STORAGE, AND HANDLING**

i. Store all materials in compliance with Manufacturer requirements to avoid water damage and store rolled goods on end. Comply with manufacturer's recommendations for job-site storage and protection. If necessary, cover with loose tarp or plastic and allow to breath.

ii. Contractor will adhere to all requirements regarding staging location, site management and occupant safety to assure that both Contractor(s) crew and public / County personnel and the public are protected at all times.

iii. Contractor will supply a duplicate key or Code to operate all equipment being stored on site to facilitate (if necessary) moving this equipment if required by first responders.

iv. Contractor / Crew will prevent any blowing debris throughout the execution of the work. All material will be properly secured. Any material roof loaded must be tied or secured when not performing repairs on site. All debris will be bagged and placed in a receptacle or dump trailer.

v. All material deliveries to be coordinated with **Brazos County Personnel.**

vi. Contractor will at no time while positioned on the roof load material or equipment from ridge to eave over entrance and exits of the buildings.

d. **JOB CONDITIONS**

i. The Contractor preparing a proposal in response to this RFP acknowledges that all work is to be performed while current activities within these buildings continue or proceed. Contractor will take and include all associated costs for signage, caution tape and safety cones to assure the tenant and public are protected from harm.

ii. All work areas to be properly roped off.

iii. Proceed with installation work only after substrate is prepared, clean, smooth, and dry.

iv. Proceed with installation work only when weather conditions allow. Follow primary manufacturer's recommendations during application throughout.

v. Contractor agrees to schedule work on individual building / Roof area only after verification that the County does not have any pre-scheduled events and/or conflicts without penalty or cost to the County.

vi. Contractor Project Manager will advise the Member each day on the prior days weather forecast. Each day that the forecast includes a greater than 30% (for that window of time) chance of rain and/or Winds forecast to be in excess of 15-20 mph the contractor will have the option to schedule a "no-work" weather delay day.

vii. Contractor is at all times required to maintain a watertight condition on all buildings being repair / under construction. Contractor and his Insurance Company will be responsible for any damage to the interior and/or exterior) caused due to negligence on the contractor's part. The contractor agrees to keep all buildings in a watertight condition until such time that the Building/Project ID# has been substantially completed and closeout documents submitted.

viii. COVID-19 / Pandemic: Contractor will adhere to all guidelines, procedures and policies regarding the County's official and published requirements concerning Covid-19 and PPE and include in his/her proposal all necessary costs to comply.

1.2 Scope of work: Contractor shall furnish and install all necessary materials to perform the following:

a. **DEMO:** Remove the existing metal counter flashings.

b. **Inspection and Evaluations:**

i. **Fastener Pull-out Test:** Contractor to verify substrate is clean and dry. Contractor to perform fastener pull test to assure pull out and required spacing for any fasteners.

c. **New System:**

i. Contractors to furnish and install, via Loosely Laid Method, Duro-Guard® Type VIII EPS (Flute Filler) to match the existing flute measurements.

ii. Contractor shall furnish and install, via mechanical attachment, a manufacturer's approved ¼" Primed (adhered approved) Gypsum Roof Board (DensDeck, DexCell, Secruck, etc.), over the loose laid flute fill insulation.

iii. Contractor shall furnish and install, via adhered attachment, an 80 MIL fleeceback over the manufacturer's approved ¼" Gypsum Roof Board using CR 20 adhesive.

1. Contractor will need to protect against using equipment that is soiled in Asphalt during installation of new roof assembly since Asphalt is a contaminate to PVC.
2. Contractor is to refrain from using cords and equipment that may have asphalt residue on it and could contaminate or discolor the new Fully adhered PVC Membrane.
3. Any asphalt residue on the surface of the finished membrane will be required to be removed prior to final inspection.

iv. **Peel Stop Detail**: Contractor shall furnish and install all materials necessary to complete the manufacturer's **Peel Stop Detail**. Detail # AS9060A or #AS9060B

v. **All Walls:** Membrane Attachment to Walls:

1. Option 1: Contractor shall furnish and install all necessary materials to adhere fleeceback membrane to the existing wall substrate, in accordance with manufacturer's specifications. Water Based Adhesive with Fleeceback membrane has been approved for this application.
2. Option 2:
   a. Contractor shall furnish and install, via mechanical attachment, a manufacturer's approved ¼" Gypsum Roof Board on the exposed face.
   b. Contractor shall furnish and install, via adhered attachment, an 80 MIL Bareback membrane with solvent based adhesive.

vi. **Gutters:** Contractor shall furnish and install all necessary materials to terminate the membrane at the gutter with Exceptional Metals Vinyl Coated Metal Drip Edge.

d. **Non-Duro-Last Items:** Lightning Protection (if applicable): Contractor shall provide, in their proposal, the cost associated with removal, reinstallation, and 5-year State certification for all lightning protection associated with the project.

e. **Warranty:**
   i. Contractor Warranty: Provide Contractors 5-Yeat Contractors Warranty
   ii. Manufacture Warranty: Provide 20-year "No Dollar Limit" Guaranty.

1.3 SECTION INCLUDES

A. Overlay existing metal roof.

B. Duro-Last® Duro-Fleece™ membrane adhered with Duro-Fleece CR-20 membrane adhesive, splatter applied.

C. DensDeck® Prime Roof Board, attached with mechanical fasteners.

D. Duro-Guard® Type VIII EPS (Flute Filler), loosely laid.

E. Prefabricated flashings, corners, parapets, stacks, vents, and related details.

F. Fasteners, adhesives, and other accessories required for a complete roofing installation.

G. Traffic Protection.

1.4 REFERENCES

A. NRCA - The NRCA Roofing and Waterproofing Manual.

B. ASCE 7 - Minimum Design Loads For Buildings And Other Structures.

C. UL - Roofing Materials and Systems Directory, Roofing Systems (TGFU.R10128).

D. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

E. ASTM D 751 - Standard Test Methods for Coated Fabrics.

F. ASTM D 4434 - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.

G. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.

H. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.5 SYSTEM DESCRIPTION

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

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

C. Physical Properties:

1. Roof product must meet the requirements of Type III PVC sheet roofing as defined by ASTM D 4434 and must meet or exceed the following physical properties.
2. Thickness: 80 mil (101 mil including fleece), nominal, in accordance with ASTM D 751.
3. Thickness Over Scrim: ≥ 41 mil in accordance with ASTM D 7635.
4. Breaking Strengths: ≥ 545 lbf. (MD) and ≥ 376 lbf. (XMD) in accordance with ASTM D 751, Grab Method.
5. Elongation at Break: ≥ 34% (MD) and ≥ 33% (XMD) in accordance with ASTM D 751, Grab Method.
6. Tearing Strength: ≥ 70 lbf. (MD) and ≥ 211 lbf. (XMD) in accordance with ASTM D 751, Procedure B.
7. Low Temperature Bend (Flexibility): Pass at -40 °F in accordance with ASTM D 2136.
8. Linear Dimensional Change: ≤ 0.10% (MD) and 0.10% (XMD) in accordance with ASTM D 1204 at 176 ± 2 °F for 6 hours.
9. Water Absorption: ≤ 0.1% in accordance with ASTM D 570 at 158 °F for 166 hours.
10. Static Puncture Resistance: ≥ 33 lbs. in accordance with ASTM D 5602.
11. Dynamic Puncture Resistance: ≥ 14.7 ft-lbf. in accordance with ASTM D 5635.

D. Cool Roof Rating Council (CRRC):
   1. Membrane must be listed on CRRC website.
      a. Initial Solar Reflectance: ≥ 87%
      b. Initial Solar Reflective Index (SRI): ≥ 110

1.6 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Duro-Last data sheets on each product to be used, including:
   5. Preparation instructions and recommendations.
   6. Storage and handling requirements and recommendations.
   7. Installation methods.
   8. Maintenance requirements.

C. Shop Drawings: Indicate insulation pattern, overall membrane layout, field seam locations, joint or termination detail conditions, and location of fasteners.

D. Verification Samples: For each product specified, two samples, representing actual product, color, and finish.

8. 4 inch by 6 inch sample of roofing membrane, of color specified.
9. 4 inch by 6 inch sample of walkway pad.
10. Termination bar, fascia bar with cover, drip edge and gravel stop if to be used.
11. Each fastener type to be used for installing membrane, insulation/recover board, termination bar and edge details.

E. Installer Certification: Certification from the roofing system manufacturer that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

F. Manufacturer's warranties.

1.7 QUALITY ASSURANCE

A. Perform work in accordance with manufacturer's installation instructions.

B. Manufacturer Qualifications: A manufacturer specializing in the production of PVC membranes systems and utilizing a Quality Control Manual during the production of the membrane roofing system that has been approved by and is inspected by Underwriters Laboratories.

C. Installer Qualifications: Company specializing in installation of roofing systems similar to those specified in this project and approved by the roofing system manufacturer.

D. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.

E. There shall be no deviations from the roof membrane manufacturer's specifications or the approved shop drawings without the prior written approval of the manufacturer.

1.8 REGULATORY REQUIREMENTS

A. Conform to applicable code for roof assembly wind uplift and fire hazard requirements.

B. Fire Exposure: Provide membrane roofing materials with the following fire-test-response characteristics. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

4. Exterior Fire-Test Exposure:
    b. Class A; ASTM E 108, for application and roof slopes indicated.
5. Fire-Resistance Ratings: Comply with ASTM E 119 for fire-resistance-rated roof assemblies of which roofing system is a part.
6. Conform to applicable code for roof assembly fire hazard requirements.

C. Wind Uplift:

3. Roofing System Design: Provide a roofing system designed to resist uplift pressures calculated according to the current edition of the ASCE-7 Specification *Minimum Design Loads for Buildings And Other Structures.*

1.9 PRE-INSTALLATION MEETING

a. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following.

1. Pre-Construction Meeting; Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Contractor to provide three copies of all MSDS Sheets.
4. Contractor to submit all submittals no less than one week prior to pre-construction meeting.
5. Contractor to furnish/submit a list of all Sub-Contractors and Contacts.
6. Contractor to provide/submit a Project Contact list at the pre-con.
7. Contractor to provide/submit an Occupant notification sheet on letter head with contact numbers to advise public and occupant of upcoming construction and dates for work.
8. Review with site personnel all required access, special requirements, exit and shut down of activities daily.
9. Verify location of staging area.
10. Verify the location of Contractor access on to the roof and existing.
11. Discuss and review all safety requirements.
12. Discuss all loading of materials and securement of materials on roof and in staging area throughout project.
13. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
14. Review structural loading limitations of roof deck during and after roofing.
15. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
16. Review governing regulations and requirements for insurance and certificates if applicable.
17. Review temporary protection requirements for roofing system during and after installation.
18. Review roof observation and repair procedures after roofing installation.

A. Convene meeting not less than one week before starting work of this section.

B. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
4. Review structural loading limitations of roof deck during and after roofing.
5. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
6. Review governing regulations and requirements for insurance and certificates if applicable.
7. Review temporary protection requirements for roofing system during and after installation.
8. Review roof observation and repair procedures after roofing installation.

1.10 DELIVERY, STORAGE AND HANDLING

a. Prior to delivery of Material Contractor is to inspect the underside of the substrate to identify any locations where material placement should be limited if suspect. Contractor to also identify any incumbrances attached, hanging or otherwise at-risk during installation.

b. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

c. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

d. All products sensitive to temperature and /or exposure to the elements prior to use shall be kept in appropriate containers or brought out daily to job site.

e. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

f. Store roof materials and place equipment in a manner to avoid permanent deflection of deck.

g. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.11 WARRANTY

A. Contractor's Warranty: The contractor shall warrant the roof application with respect to workmanship and proper application for Five (5) years from the effective date of the warranty issued by the manufacturer.

B. Manufacturer's Warranty: Must be no-dollar limit type and provide for completion of repairs, replacement of membrane or total replacement of the roofing system at the then-current material and labor prices throughout the life of the warranty. In addition, the warranty must meet the following criteria:

1. Warranty Period: 20 years from date issued by the manufacturer.
2. No exclusions for ponding water
3. Warranty shall not place excessive requirements on Owner to maintain Manufacturer Warranty.
4. Acts of God, Vandalism to be excluded.
5. Must provide positive drainage.
6. No exclusion for damage caused by biological growth.
7. Issued direct from and serviced by the roof membrane manufacturer.
8. Transferable for the full term of the warranty.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: Duro-Last Roofing, Inc., which is located at: 525 Morley Drive, Saginaw, MI 48601. Telephone: 800-248-0280.

B. All roofing system components to be provided or approved by Duro-Last Roofing, Inc.

C. Substitutions: Not permitted.

2.2 ROOFING SYSTEM COMPONENTS

A. Existing Roofing system's underlayment as referenced in the Scope of Work.

B. Membrane:

a. Roofing Membrane: Duro-Last® Duro-Fleece™ membrane conforming to ASTM D 4434, type III, fabric-reinforced, PVC, NSF/ANSI 347 Gold or Platinum Certification, and a product-specific third-party verified Environmental Product Declaration. Membrane properties as follows:

b. Thickness:

c. 80 mil nominal (88 mil including fleece).

d. Exposed Face Color: White.

e. Minimum recycle content 7% post-industrial and 0% post-consumer.

f. Recycled at end of life into resilient flooring or concrete expansion joints.

C. Accessory Materials: Provide accessory materials supplied by or approved for use by Duro-Last Roofing, Inc.

a. Sheet Flashing: Manufacturer's standard reinforced PVC sheet flashing.

i. Duro-Last Factory Prefabricated Flashings: manufactured using Manufacturer's standard reinforced PVC membrane.

ii. Stack Flashings. (Split Boot ONLY)

iii. Curb Flashings.

iv. Inside and Outside Corners.

b. Sealants and Adhesives: Compatible with roofing system and supplied by Duro-Last Roofing, Inc.

i. Duro-Fleece® CR-20 Membrane Adhesive. (Field Membrane. Optional for walls and curbs)

ii. DURO-LAST SOLVENT-GRIP® SPRAY ADHESIVE (Option for walls and curbs)

iii. Water Based adhesive (Option for walls and curbs)

iv. Duro-Caulk® Plus. (back and top seals)

v. Strip Mastic. (back seals)

c. Metal Edge Products – 24 ga – Galvalume – Mill or Kynar finish (Edge Base and Cover metals, gutters, downspouts, etc.)

d. Anchor Products (Non-Penetrating anchors for Guy wires)

e. Fasteners and Plates: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane and insulation to substrate. Supplied by Duro-Last Roofing, Inc.

i. #14 Heavy Duty Fasteners.

ii. 3 inch Metal Plates.

f. Termination and Edge Details: Supplied by Duro-Last Roofing, Inc. – 24 ga – Galvalume – Mill or Kynar finish

i. Termination Bar.

ii. All Term™.

iii. Kynar Steel Fascia Cover.Vinyl Coated Metal: Supplied by Duro-Last Roofing, Inc. 24 gauge, hot-dipped galvanized, grade 90 metal with a minimum of 17 mil of Duro-Last membrane laminated to one side. Vinyl Coated Metal Products (drip edge metal, pitch pans, scuppers, etc.)

D. Substrate Board:

a. Glass-mat-faced, water-resistant gypsum substrate conforming to ASTM C 1177/C 1177M, DensDeck® Prime Roof Board as manufactured by Georgia-Pacific Corporation, OR manufacturer's approved equivalent.

b. ¼ inch thick

E. Walkways:

a. Provide non-skid, maintenance-free walkway pads in areas of heavy foot traffic and around mechanical equipment.

b. Duro-Last Roof Trak® III Walkway Pad.

F. Flute Filler: Material as supplied by Duro-Last.

a. Provide precut insulation to fill the flutes between the ribs of the metal roof.

b. Duro-Guard® EPS Type II (flat).

PART 3 EXECUTION

3.1 EXAMINATION

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

B. Replace any Wet Insulation identified and document. Report each any replacement activities to Owner through consultant / prime contractor.

C. Verify that the deck is supported and secured.

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

E. Verify that the deck surfaces are dry and free of standing water, ice or snow.

F. Verify that all roof openings or penetrations through the roof are solidly set.

G. If substrate preparation is the responsibility of another contractor, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Remove all debris and any residual moisture on membrane prior to membrane removal.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

D. Surfaces shall be clean, smooth, free of fins, sharp edges, loose and foreign material, oil, grease, and bitumen.

3.3 INSTALLATION

A. Follow all manufacture's and industry guidelines when installing tapered insulation products

B. Install insulation in accordance with the roof manufacturer's requirements.

C. Separation Board: DensDeck® Prime Roof Board.

1. Use only fasteners, stress plates and fastening patterns accepted for use by the roof manufacturer. Fastening patterns must meet applicable design requirements.
    a. Install fasteners in accordance with the roof manufacturer's requirements. Fasteners that are improperly installed must be replaced or corrected.
    b. Attach boards in parallel courses with end joints staggered 50% and adjacent boards butted together with no gaps greater than ¼ inch.
    c. Attach boards over existing EPS or ISO.
    d. At gutters and drip edge / rake conditions tapper the last 4' of insulation to assist with drainage. ¼" to 0"

D. Roof Membrane: 80 mil, Duro-Last® Duro-Fleece™ membrane.

a. Roof membrane should be unrolled and allowed to relax prior to installation.

b. Use only membrane adhesive (CR-20 HFO) acceptable to the roof manufacturer's that meets the applicable design requirements.

c. Curbs and wall membrane: Install in accordance with manufacturer's specifications utilizing either option defined in the Scope of Work.

d. Cut membrane to fit neatly around all penetrations and roof projections.

e. Unroll roofing membrane and positioned with a minimum 6 inch overlap along the selvage edge. Roll ends must be butted together and membrane of the same mil thickness, without fleece backing, must be used to form the end lap.

f. Apply adhesive in accordance with the roof manufacturer's requirements.

g. Apply adhesive in splatter pattern.

h. Follow guidelines outlined in the adhesive's Product Data Sheet.

i. Read the adhesive's Material Safety Data Sheet (MSDS) prior to using the adhesive.

E. Seaming:

1. Weld overlapping sheets together using hot air. Minimum weld width is 1-1/2 inches.
2. Check field welded seams for continuity and integrity and repair all imperfections by the end of each work day.
3. Any wrinkles or non-uniform laps shall be cut and patched.

F. Membrane Termination/Securement: All membrane terminations shall be completed in accordance with the membrane manufacturer's requirements.

1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
2. Provide securement at any angle change where the slope or combined slopes exceeds two inches in one horizontal foot.
3. All exposed Termination bar will be the 1-3/4" Fascia Bar with Metal Cover.

G. Flashings: Complete all flashings and terminations as indicated on the drawings and in accordance with the membrane manufacturer's requirements.

1. Provide securement at all membrane terminations at the perimeter of each roof level, roof section, curb flashing, skylight, expansion joint, interior wall, penthouse, and other similar condition.
   a. Do not apply flashing over existing thru-wall flashings or weep holes.
   b. Secure flashing on a vertical surface before the seam between the flashing and the main roof sheet is completed.
   c. Extend flashing membrane a minimum of 6 inches (152 mm) onto the main roof sheet beyond the mechanical securement.
   d. Use care to ensure that the flashing does not bridge locations where there is a change in direction (e.g. where the parapet meets the roof deck).
2. Penetrations:
   a. Flash all pipes, supports, soil stacks, cold vents, and other penetrations passing through the roofing membrane as indicated on the Drawings and in accordance with the membrane manufacturer's requirements.
   b. Utilize custom prefabricated flashings supplied by the membrane manufacturer.
   c. Existing Flashings: Remove when necessary to allow new flashing to terminate directly to the penetration.
3. Pipe Clusters and Unusual Shapes:
   a. Clusters of pipes or other penetrations which cannot be sealed with prefabricated membrane flashings shall be sealed by surrounding them with a prefabricated vinyl-coated metal pitch pan and sealant supplied by the membrane manufacturer.
   b. Vinyl-coated metal pitch pans shall be installed, flashed and filled with sealant in

accordance with the membrane manufacturer's requirements.

c. Pitch pans shall not be used where prefabricated or field fabricated flashings are possible.

H. Roof Drains:

1. Coordinate installation of roof drains and vents specified in Section 15146 - Plumbing Specialties.
2. Remove existing flashing and asphalt at existing drains in preparation for sealant and membrane.
3. Provide a smooth clean surface on the mating surface between the clamping ring and the drain base.

I. Edge Details:

1. Provide edge details as indicated on the Drawings or listed in Scope of Work. Install in accordance with the membrane manufacturer's requirements.
2. Join individual sections in accordance with the membrane manufacturer's requirements.
3. Coordinate installation of metal flashing and counter flashing specified in Section 07620.
4. Manufactured Roof Specialties: Coordinate installation of copings, counter flashing systems, gutters, downspouts, and roof expansion assemblies specified in Section 07710.

J. Walkways:

1. Install walkways in accordance with the membrane manufacturer's requirements.
2. Provide walkways where indicated on the Drawings.
3. Install walkway pads at roof hatches, access doors, rooftop ladders and all other traffic concentration points regardless of traffic frequency. Provided in areas receiving regular traffic to service rooftop units or where a passageway over the surface is required.
4. Do not install walkways over flashings or field seams until manufacturer's warranty inspection has been completed.

K. Water cut-offs:

1. Provide water cut-offs on a daily basis at the completion of work and at the onset of inclement weather.
2. Provide water cut-offs to ensure that water does not flow beneath the completed sections of the new roofing system.
3. Remove water cut-offs prior to the resumption of work.
4. The integrity of the water cut-off is the sole responsibility of the roofing contractor.
5. Any membrane contaminated by the cut-off material shall be cleaned or removed.

3.4 FIELD QUALITY CONTROL

G. Interim Site inspection a manufacturer's representative shall be performed on a weekly basis.

H. A report of all the inspections shall be forwarded to the Consultant within 48 business hours.

I. Contractor will correct all deficiencies, noted in the inspection, before following week's inspection.

J. The membrane manufacturer's representative shall provide a comprehensive final inspection after completion of the roof system. All application errors shall be addressed and final punch list completed.

K. A Final inspection, to include the Owner's Representative, Consultant, and Contractor, will not be scheduled until the contractor has confirmed the Manufacturer's inspection and issuance of the warranty (20 Year NDL Guaranty) has been completed.

L. Upon receipt or confirmation of Manufacturer's successful completion and issuing of the NDL Warranty, the Contractor will schedule with a Final Walk-through and inspection with the Owner's representative and consultant. Any defects noted in the final walk-through and inspection will be repaired by the contractor, within 5 business days. If the Owner's representative so desires, the Consultant can perform a follow-up final inspection. Any cost for a required third inspection would be at the cost of the Contractor.

3.5 PROTECTION

A. Protect installed roofing products from construction operations until completion of project.

B. Where traffic is anticipated over completed roofing membrane, protect from damage using durable materials that are compatible with membrane.

C. Contractor will remove any foreign products from surface of membrane prior to final inspection. Any foreign products documented on or under the surface will be required to be removed prior to closeout.

D. Contractor will be responsible for cleaning any membrane that is marked or damaged by foreign material spillage or otherwise. Contractor may at his own cost be required to wash the service of the membrane should this be identified or marked during the final inspection.

E. Contractor shall clean/remove all asphalts, rubber tire or other marks from the finished membrane prior to closeout. All adhesive or caulk shall also be removed prior to acceptance.

F. Repair or replace all punch list items prior to closeout documents. This would include all roofing issues as well as repair of the staging area and remaining material must be removed from site.

END OF SECTION

Brazos County Detention Center

1835 Sandy Point Rd
Bryan, TX 77807

Roof #s 12A – 12D

Prepared For: Chenelle Plyler
Duro-Last Roofing, Inc

SECTION 07 41 13 - METAL ROOF PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Contractor to include in his proposal the cost to remove and replace the existing metal panels located at the following locations:

- **Portico Metal Roof (Area #11):**

Remove and replace Metal Roofing	5,496.72 s.f.
Remove and Replace synthetic underlayment	5,496.72 s.f.
Remove and replace eave trim.	208 l.f. s.f.
Detach / Reset and Certify Lightning Protection	408.00 l.f.

- **Metal Awnings (Area #12):**

Remove and replace Metal Roofing	1,472.69s.f.
Remove and Replace synthetic underlayment	1,476.69 s.f.
Remove and replace eave trim.	211.01 s.f.
Remove and replace gable trim	195.00 s.f.
Remove and replace Counterflashing - Apron.	195.00 s.f.

- **Ribbed Metal Roof (Area #16)**

Remove and replace Metal Roofing	1,472.69s.f.
Remove and Replace synthetic underlayment	1,476.69 s.f.
Remove and replace eave trim.	211.01 s.f.
Remove and replace gable trim	195.00 s.f.

Remove and replace Counterflashing - Apron. 195.00 s.f.

B. Mechanically seamed, standing seam metal roof panels, with related metal trim and accessories. The existing standing seam roof shall be removed down to the existing deck followed by new underlayment over the existing wood solid deck. Fastening to the existing deck shall not penetrate down and through the existing wood deck.

C. Contractor shall install new High Temp 40 mil peel n stick membrane over the existing prior to installing the new Standing Seam metal roof assembly.

D. Contractor shall retain the existing Gutters and Downspouts in place.

1.2 RELATED REQUIREMENTS

A. Division 01 Section "Sustainable Design Requirements" for related LEED® general requirements.

B. Division 05 Section "Steel Decking" for continuous metal decking supporting metal panels.

C. Division 07 Section "Air Barriers" for air barriers within roof assembly and adjacent to roof assembly. All underlayment shall be **High Temperature** and designed to be installed directly below the standing seam metal panel.

D. Division 07 Section "Sheet Metal Flashing and Trim" for formed sheet metal copings, flashings, reglets, and roof drainage items in addition to items specified in this Section.

E. Division 07 Section "Manufactured Roof Specialties" for manufactured copings, reglets, and roof drainage items in addition to items specified in this Section.

F. Division 07 Section "Joint Sealants" for field-applied joint sealants.

1.3 REFERENCES

A. American Architectural Manufacturer's Association (AAMA):

1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
2. AAMA 809.2 - Voluntary Specification Non-Drying Sealants.

B. American Society of Civil Engineers (ASCE):

1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

C. ASTM International (ASTM):

1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. ASTM A 755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Pre-painted by the Coil-Coating Process for Exterior Exposed Building Products.
3. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
4. ASTM A 980 - Standard Specification for Steel, Sheet, Carbon, Ultra High Strength Cold Rolled.
5. ASTM C 645 - Specification for Nonstructural Steel Framing Members.
6. ASTM C 920 - Specification for Elastomeric Joint Sealants.

7. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
8. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
9. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
10. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
11. ASTM E 1980 - Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

D. International Accreditation Service (IAS):

1. **IAS AC 472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.**

E. **Underwriters Laboratories, Inc.** (UL):

1. UL 580 - Tests for Uplift Resistance of Roof Assemblies

1.4 ADMINISTRATIVE REQUIREMENTS

A. Pre-installation Meeting: Prior to erection of framing, conduct pre-installation meeting at the site, attended by owner/owner representative, architect, manufacturer's technical representative, inspection agency and related trade contractors.

1. Coordinate building framing in relation to metal panel system.
2. Coordinate openings and penetrations of metal panel system.
3. Coordinate work of Division 07 Sections "Roof Specialties" and "Roof Accessories" and openings and penetrations and manufacturer's accessories with installation of metal panels.

1.5 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal roof panel assembly and accessories from a single manufacturer providing fixed-base roll forming, and accredited under IAS AC 472 Part B. Use of Portable on/ or Off Site Portable Equipment shall not be authorized.

B. Manufacturer Qualifications: Approved manufacturer listed in this section with minimum five years experience in manufacture of similar products in successful use in similar applications.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

a. Product data, including certified independent test data indicating compliance with requirements.
b. Samples of each component.
c. Sample submittal from similar project.
d. Project references: Minimum of five installations not less than five years old, with owner and architect contact information.
e. Sample warranty.
f. IAS AC 472 certificate.

2. Substitutions following award of contract are not allowed.
3. Approved manufacturers must meet separate requirements of Submittals Article.

C. Installer Qualifications: Experienced installer certified by metal panel manufacturer with minimum of five years' experience with successfully completed projects of a similar nature and scope.

1. Installer's Field Supervisor: Experienced mechanic certified by metal panel manufacturer supervising work on site whenever work is underway.

1.6 ACTION SUBMITTALS

A. Product Data: Manufacturer's data sheets for specified products..

B. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1 ½" per foot showing edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, roof accessories, lightning arresting equipment, and special details. Make distinctions between factory and field assembled work.

1. Indicate points of supporting structure that must coordinate with metal panel system installation.
2. Include data indicating compliance with performance requirements.
3. Include structural data indicating compliance with requirements of authorities having jurisdiction.

C. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.

D. Samples for Verification: Provide 11.75" (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Indicating compliance of products with requirements, witnessed by a professional engineer.

B. Qualification Information: For installer firm and installer's field supervisor.

C. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of **IAS AC 472.**

D. Manufacturer's Warranty: Sample copy of manufacturer's material and paint finish warranty and shall be prior submitted and included prior to final payment.

1.8 CLOSEOUT SUBMITTALS

A. Maintenance data.

B. Manufacturer's Warranty: 20 Year Weather Tightness Warranty Executed copy of manufacturer's standard warranty.

C. See additional Closeout documents required in general scope of work and execution.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.

1. Deliver, unload, store, and erect metal panel system and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.

2. Store in accordance with Manufacturer's written instructions. Provide wood collars for stacking and handling in the field.

1.10 COORDINATION

A. Coordinate sizes, profiles, and locations of roof curbs and other roof-mounted equipment and roof penetrations, based upon sizes of actual selected equipment.

1.11 WARRANTY

A. Special Manufacturer's Warranty: On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion. Warranty coverage shall be for 20 years.

B. Finish Warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis of Design Manufacturer:

1. Provide basis of design product: Batten Lock Seam 24-Gauge.

2.2 PERFORMANCE REQUIREMENTS

A. General: Provide metal roof panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.

B. Recycled Content: For Steel Products: Post-consumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

C. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated:

1. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.

   a. Wind Uplift Testing: Certify capacity of metal panels by actual testing of proposed assembly per ASTM E 1592.

2. Snow Loads: **10** lbs.sq. ft.
3. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/180 of the span with no evidence of failure.
4. Seismic Performance: Comply with ASCE 7,(current edition) Section 9, "Earthquake Loads."

D. Wind Uplift Resistance: Comply with UL 580 for wind-uplift class UL-90.

E. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

F. **Self-Adhering, High-Temperature Underlayment**: Cold-applied sheet underlayment minimum 40 mils (0.76 mm) thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer for substrate.

2.3 METAL ROOF PANELS

A. Mechanically seamed, Concealed Fastener, Metal Roof Panels: Structural metal roof panel consisting of formed metal sheet with vertical ribs at panel edges, installed by lapping and mechanically interlocking edges of adjacent panels, and attaching panels to supports using concealed clips and fasteners in a weathertight installation.

1. Basis of Design: Lock Seam Metal Panel
2. **Aluminum-Zinc Alloy-Coated Steel Sheet**: ASTM A 792/A 792M, structural quality, Grade 50, Coating Class AZ50 (Grade 340, Coating Class AZM150), pre-painted by the coil-coating process per ASTM A 755/A 755M.

    a. Nominal Coated Thickness :24-gauge Grade 50
    b. Panel Surface: Smooth with **striations** in pan.
    c. Exterior Finish: Fluoropolymer two-coat system.
    d. Color: As selected by architect from manufacturer's standard colors.

3. Panel Width: 16" (457 mm).
4. Panel Seam Height: 2.0" (50.8 mm).
5. Joint Type: Mechanically Seamed.

2.4 METAL ROOF PANEL ACCESSORIES

A. General: Provide complete metal roof panel assembly incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings, in manufacturer's standard profiles as indicated. Provide required fasteners, closure strips, thermal spacers, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.

B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.

C. Panel Clips: ASTM C 645, with ASTM A 653/A 653M, G90 (Z180) hot-dip galvanized zinc coating, configured for concealment in panel joints, and identical to clips utilized in tests demonstrating compliance with performance requirements.

D. Panel Fasteners: Self-tapping screws and other acceptable corrosion-resistant fasteners recommended by roof panel manufacturer. Where exposed fasteners cannot be avoided, supply fasteners with EPDM or neoprene gaskets, with heads matching color of metal panels by means of factory-applied coating.

E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:

1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
3. Concealed Joint Sealant: Non-curing butyl, AAMA 809.2.

F. **Roof Accessories**: Approved by metal roof panel manufacturer. Refer to Section 07 72 00 "Roof Accessories" for requirements for curbs, equipment supports, roof hatches, heat and smoke vents, ventilators, and preformed flashing sleeves.

2.5 FABRICATION

A. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.

B. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.

C. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

2.6 FINISHES

A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

A. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A, 792M Structural quality Grade 50.

1. Basis of Design: **Lock-Seam Metal Panels 24 Gauge**

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine metal panel system substrate and supports with installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panel installation.

1. Inspect metal panel support substrate to determine if support components are installed as indicated on approved shop drawings. Confirm presence of acceptable supports at recommended spacing to match installation requirements of metal panels.
2. Panel Support Tolerances: Confirm that panel supports are within tolerances acceptable to metal panel system manufacturer but not greater than the following:

a. 1/4" (6 mm) in 20 foot (6.1 m) in any direction.
b. 3/8" (9 mm) over any single roof plane.

B. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal roof panel system installation.

3.2 PREPARATION

A. **Miscellaneous Supports**: Install subframing, girts, furring, and other miscellaneous panel support members according to ASTM C 754 and manufacturer's written instructions.

B. **Self-Adhering Sheet Underlayment**: Apply in accordance with underlayment manufacturer's written instructions; apply primer if required. Apply at locations indicated below. Roll laps with roller.
1. Apply over the entire roof surface.
2. Lap over edges of self-adhering sheet underlayment not less than 6" (150 mm).

C. Flashings: Provide flashings as required to complete metal roof panel system. Install in accordance with Section 07 62 00 "Sheet Metal Flashing and Trim" and approved shop drawings.

3.3 METAL PANEL INSTALLATION

A. Mechanically Seamed, Standing Seam Metal Roof Panels: Install weathertight metal panel system in accordance with manufacturer's written instructions, and project drawings. Install metal roof panels in orientation, sizes, and locations indicated, free of waves, warps, buckles, fastening stresses, and distortions. Anchor panels and other components securely in place. Provide for thermal and structural movement.

B. All panels shall be factory formed in a controlled environment, free of construction dirt/dust/debris. **Use of on-site portable roll forming on or off site will not be acceptable.** Manufacturer of the roof panels shall provide certificate of compliance under IAS AC472 Part B. No alternative methods will be allowed, all submittals shall be provided and approved prior to release of contract to proceed. Mill certifications may be required in conformance with IAS AC472 Part B standards. All roof systems, Standing Seam and Single Ply Membranes shall be as provided and warranted by a Sole Manufacturer of both systems, providing for a "Total System;" by a single sourced roofing manufacture.

C. Attach panels to supports using clips, screws, fasteners, and sealants recommended by manufacturer and indicated on approved shop drawings.

1. Fasten metal panels to supports with concealed clips at each location indicated on approved shop drawings, with spacing and fasteners recommended by manufacturer.
2. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.
3. Provide weatherproof jacks for pipe and conduit penetrating metal panels of types recommended by manufacturer.
4. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.
5. Panels shall be hemmed (cleated) at all eave and valley transitions. No exposed fasteners shall be accepted when installing the panels to the deck/rake/eave/valley conditions.

3.4 ACCESSORY INSTALLATION

A. General: Install metal panel trim, flashing, and accessories using recommended fasteners and joint sealers, with positive anchorage to building, and with weather tight mounting. Provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
3. Provide concealed fasteners except where noted on approved shop drawings.
4. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.

B. Joint Sealers: Install joint sealers where indicated and where required for weathertight performance of metal panel assemblies, in accordance with manufacturer's written instructions.

1. Prepare joints and apply sealants per requirements of Division 07 Section "Joint Sealants."

3.5 FIELD QUALITY CONTROL

A. Testing Agency: 4T Partnership LLC.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective films immediately in accordance with metal roof panel manufacturer's instructions. Clean finished surfaces as recommended by metal roof panel manufacturer.

B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the architect.

END OF SECTION