CITIZENS PROPERTY INSURANCE CORPORATION

BUILDING TYPE II AND III MITIGATION INSPECTION FORM

This Mitigation Inspection Form must be completed to capture mitigation features applicable to a Type II (4 to 6 story) or Type III (7 or more story) building. This Inspection Form is required for either residential condominium unit owners or commercial residential applicants requesting mitigation credits in such buildings.

WIND LOSS MITIGATION INFORMATION			
PREMISES #:		SUBJECT OF INSURANCE:	POLICY #:
BUILDING #:		STREET ADDRESS: **4939 Florama Terrace New Port Richey, Fl. 34652**	
# STORIES:		BLDG DESCRIPTION:	
BUILDING TYPE: ☐ II **(4 to 6 stories)** ☒ III **(7 or more stories)**			

Terrain Exposure Category must be provided for each insured location.

I hereby certify that the building or unit at the address indicated above **TERRAIN EXPOSURE CATEGORY** as defined under the Florida Building Code is (Check One): ☐ **Exposure C** or ☐ **Exposure B**

Certification below for purposes of **TERRAIN EXPOSURE CATEGORY** above does not require personal inspection of the premises.

Certification of Wind Speed is required to establish the basic wind speed of the location (Complete for Terrain B only if Year Built On or After Jan.1, 2002).

I hereby certify that the basic **WIND SPEED** of the building or unit at the address indicated above based upon county wind speed lines defined under the Florida Building Code (FBC) is (Check One): ☐ **≥100** or ☐ **≥110** or ☐ **≥120**

Certification of Wind Design is required when the buildings is constructed in a manner to exceed the basic wind speed design established for the structure location (Complete for Terrain B only if Year Built On or After Jan.1, 2002).

I hereby certify that the building or unit at the address indicated above is designed and mitigated to the Florida Building Code (FBC) **WIND DESIGN** of (Check One): ☐ **≥100** or ☐ **≥110** or ☐ **≥120**

Certification for the purpose of establishing the basic **WIND SPEED or WIND SPEED DESIGN** above does not require personal inspection of the premises.

Specify the type of mitigation device(s) installed:

NOTE: Any documentation used in validating the compliance or existence of each construction or mitigation attribute must accompany this form. At least one photo documenting the existence of each visible and accessible construction or mitigation attribute marked in Sections 1 through 4 must accompany this form.

1. Roof Coverings

Roof Covering Material: membrane **Date of Installation:** 5/8-5/26 2023

☐ **Level A (Non FBC Equivalent) – Type II or III**

One or more roof coverings that do not meet the FBC Equivalent definition requirements below.

☒ **Level B (FBC Equivalent) – Type II or III**

Single-Ply, Modified Bitumen, Sprayed Polyurethane foam, Metal, Tile, Built-up, Asphalt Shingle or Rolled Roofing, or other roof covering membranes/products that at a minimum meet the 2001 or later Florida Building Code or the 1994 South Florida Building Code and have a Miami-Dade NOA or FBC 2001 Product Approval listing that is/was current at the time of installation.

All mechanical equipment must be adequately tied to the roof deck to resist overturning and sliding during high winds. Any flat roof covering with flashing or coping must be mechanically attached to the structure with face fasteners (no clip/cleat systems), and asphalt roof coverings on flat roofs must be 10 years old or less.

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2. Roof Deck Attachment

☐ **Level A – Wood or Other Deck Type II only**

Roof deck composed of sheets of structural panels (plywood or OSB).
Or
Architectural (non-structural) metal panels that require a solid decking to support weight and loads.
Or
Other roof decks that do not meet Levels B or C below.

☐ **Level B – Metal Deck Type II or III**

Metal roof deck made of structural panels fastened to open-web steel bar joists and integrally attached to the wall.

☒ **Level C – Reinforced Concrete Roof Deck Type, II or III**

A roof structure composed of cast-in-place or pre-cast structural concrete designed to be self-supporting and integrally attached to wall/support system.

3. Secondary Water Resistance

☒ **Underlayment** A self-adhering polymer modified bitumen roofing underlayment (thin rubber sheets with peel and stick underside located beneath the roof covering and normal felt underlayment) with a minimum width of 6" meeting the requirements of ASTM D 1970 installed over all plywood/OSB joints to protect from water intrusion. All secondary water resistance products must be installed per the manufacturer's recommendations. Roofing felt or similar paper based products are not acceptable for secondary water resistance.

☐ **Foamed Adhesive**

A foamed polyurethane sheathing adhesive applied over all joints in the roof sheathing to protect interior from water intrusion.

4. Opening Protection

☐ **Class A (Hurricane Impact)** – All glazed openings (windows, skylights, sliding glass doors, doors with windows, etc) less than 30 feet above grade must be protected with impact resistant coverings (e.g. shutters), impact resistant doors, and/or impact resistant glazing that meet the Large Missile (9 lb.) impact requirements of:

☐**SSTD12;**
☐**ASTM E 1886 and ASTM E 1996;**
☐**Miami-Dade PA 201, 202, and 203;**
☐**Florida Building Code TAS 201, 202 and 203.**

All glazed openings less than 30 feet above grade shall meet the Large Missile Test standard referenced above. All glazed openings between 30 and 60 feet above grade must meet the Small Missile Test of the respective standard. For buildings located in the HVHZ (High Velocity Hurricane Zone) all glazed openings greater than 60 feet above grade must also meet the Small Missile Test of the respective standard.

☐ **Class B (Basic Impact)** – All glazed openings (windows, skylights, sliding glass doors, doors with windows, etc) less than 30 feet above grade must be protected with impact resistant coverings (e.g. shutters), impact resistant doors, and/or impact resistant glazing that meet the Large Missile (4.5 lb.) impact requirements of:

☐**ASTM E 1886 and ASTM E 1996**

All glazed openings less than 30 feet above grade shall meet the Large Missile Test standard referenced above. All glazed openings between 30 and 60 feet above grade must meet the Small Missile Test of the respective standard. For buildings located in the HVHZ (High Velocity Hurricane Zone) all glazed openings greater than 60 feet above grade must also meet the Small Missile Test of the respective standard.

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BUILDING TYPE II AND III MITIGATION INSPECTION FORM

CERTIFICATION

I certify that I hold an active license as a: (*CHECK ONE OF THE FOLLOWING*)

☐ **General or building contractor licensed under Section 489.111, Florida Statutes.**

☐ **Building code inspector certified under Section 468.607, Florida Statutes.**

☐ **Professional architect licensed under Section 481.213, Florida Statutes.**

☐ **Professional engineer licensed under Section 471.015, Florida Statutes.**

I also certify that I personally inspected the premises at the Location Address listed above on the inspection date provided on this Mitigation Inspection Form. In my professional opinion, based on my knowledge, information and belief, I certify that the above statements are true and correct.

This Mitigation Inspection Form and the information set forth in it are provided solely for the purpose of verifying that certain structural or physical characteristics exist at the Location Address listed above and for the purpose of permitting the Named Insured to receive a property insurance premium discount on insurance provided by Citizens Property Insurance Corporation and for no other purpose. The undersigned does not make a health or safety certification or warranty, express or implied, of any kind, and nothing in this Form shall be construed to impose on the undersigned or on any entity to which the undersigned is affiliated any liability or obligation of any nature to the named insured or to any other person or entity.

Name of Company:	Richard Pickle Ent, Inc			**Phone:**	813-843-8564
Name of Inspector	Richard Pickle	**License Type**		**License #**	CRC057977; HI # 307
Inspection Date:	5/24/23				
Signature:				**Date:**	6/9/23
Applicant /Insured's Signature *:				**Date:**	

***Applicant /Insured's signature must be from the Board President and another member of the board for condo and homeowner's associations or an officer of the named insured for all other business entities.**

"Any person who knowingly and with intent to injure, defraud, or deceive any insurer files a statement of claim or an application containing any false, incomplete, or misleading information is guilty of a felony of the third degree."

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Uniform Mitigation Verification Inspection Form

Maintain a copy of this form and any documentation provided with the insurance policy

Inspection Date:	5/24/23		
Owner Information			
Owner Name:	Castle Council Inc		Contact Person:
Address:	4939 Floramar Terrace New Port Richey, Fl. 34652		Home Phone:
City:	New Port Richey	Zip: 34652	Work Phone:
County:	Pasco		Cell Phone:
Insurance Company:			Policy #:
Year of Home:	1977	# of Stories: 9	Email:

NOTE: Any documentation used in validating the compliance or existence of each construction or mitigation attribute must accompany this form. At least one photograph must accompany this form to validate each attribute marked in questions 3 though 7. The insurer may ask additional questions regarding the mitigated feature(s) verified on this form.

1. **Building Code**: Was the structure built in compliance with the Florida Building Code (FBC 2001 or later) OR for homes located in the HVHZ (Miami-Dade or Broward counties), South Florida Building Code (SFBC-94)?
   - ☐ A. Built in compliance with the FBC: Year Built _____. For homes built in 2002/2003 provide a permit application with a date after 3/1/2002: Building Permit Application Date (MM/DD/YYYY) ____/____/_____
   - ☐ B. For the HVHZ Only: Built in compliance with the SFBC-94: Year Built _____. For homes built in 1994, 1995, and 1996 provide a permit application with a date after 9/1/1994: Building Permit Application Date (MM/DD/YYYY) ___/___/_____
   - ☒ C. Unknown or does not meet the requirements of Answer "A" or "B"

2. **Roof Covering:** Select all roof covering types in use. Provide the permit application date OR FBC/MDC Product Approval number OR Year of Original Installation/Replacement OR indicate that no information was available to verify compliance for each roof covering identified.

2.1 Roof Covering Type:	Permit Application Date	FBC or MDC Product Approval #	Year of Original Installation or Replacement	No Information Provided for Compliance
☐ 1. Asphalt/Fiberglass Shingle	___/___/_____			☐
☐ 2. Concrete/Clay Tile	___/___/_____			☐
☐ 3. Metal	___/___/_____			☐
☐ 4. Built Up	___/___/_____			☐
☒ 5. Membrane	2 / 3 / 23	23B00165	2023	☐
☐ 6. Other_____	___/___/_____			☐

   - ☒ A. All roof coverings listed above meet the FBC with a FBC or Miami-Dade Product Approval listing current at time of installation OR have a roofing permit application date on or after 3/1/02 OR the roof is original and built in 2004 or later.
   - ☐ B. All roof coverings have a Miami-Dade Product Approval listing current at time of installation OR (for the HVHZ only) a roofing permit application after 9/1/1994 and before 3/1/2002 OR the roof is original and built in 1997 or later.
   - ☐ C. One or more roof coverings do not meet the requirements of Answer "A" or "B".
   - ☐ D. No roof coverings meet the requirements of Answer "A" or "B".

3. **Roof Deck Attachment**: What is the **weakest** form of roof deck attachment?
   - ☐ A. Plywood/Oriented strand board (OSB) roof sheathing attached to the roof truss/rafter (spaced a maximum of 24" inches o.c.) by staples or 6d nails spaced at 6" along the edge and 12" in the field. -OR- Batten decking supporting wood shakes or wood shingles. -OR- Any system of screws, nails, adhesives, other deck fastening system or truss/rafter spacing that has an equivalent mean uplift less than that required for Options B or C below.
   - ☐ B. Plywood/OSB roof sheathing with a minimum thickness of 7/16"inch attached to the roof truss/rafter (spaced a maximum of 24"inches o.c.) by 8d common nails spaced a maximum of 12" inches in the field.-OR- Any system of screws, nails, adhesives, other deck fastening system or truss/rafter spacing that is shown to have an equivalent or greater resistance 8d nails spaced a maximum of 12 inches in the field or has a mean uplift resistance of at least 103 psf.
   - ☐ C. Plywood/OSB roof sheathing with a minimum thickness of 7/16"inch attached to the roof truss/rafter (spaced a maximum of 24"inches o.c.) by 8d common nails spaced a maximum of 6" inches in the field. -OR- Dimensional lumber/Tongue & Groove decking with a minimum of 2 nails per board (or 1 nail per board if each board is equal to or less than 6 inches in width). -OR- Any system of screws, nails, adhesives, other deck fastening system or truss/rafter spacing that is shown to have an equivalent

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or greater resistance than 8d common nails spaced a maximum of 6 inches in the field or has a mean uplift resistance of at least 182 psf.

- ☐ D. Reinforced Concrete Roof Deck.
- ☐ E. Other: _____
- ☐ F. Unknown or unidentified.
- ☒ G. No attic access.

4. **Roof to Wall Attachment:** What is the **WEAKEST** roof to wall connection? (Do not include attachment of hip/valley jacks within 5 feet of the inside or outside corner of the roof in determination of WEAKEST type)
   - ☐ A. Toe Nails
     - ☐ Truss/rafter anchored to top plate of wall using nails driven at an angle through the truss/rafter and attached to the top plate of the wall, or
     - ☐ Metal connectors that do not meet the minimal conditions or requirements of B, C, or D

   Minimal conditions to qualify for categories B, C, or D. All visible metal connectors are:
     - ☐ Secured to truss/rafter with a minimum of three (3) nails, **and**
     - ☐ Attached to the wall top plate of the wall framing, or embedded in the bond beam, with less than a ½" gap from the blocking or truss/rafter **and** blocked no more than 1.5" of the truss/rafter, **and** free of visible severe corrosion.
   - ☐ B. Clips
     - ☐ Metal connectors that do not wrap over the top of the truss/rafter, **or**
     - ☐ Metal connectors with a minimum of 1 strap that wraps over the top of the truss/rafter and does not meet the nail position requirements of C or D, but is secured with a minimum of 3 nails.
   - ☐ C. Single Wraps
     Metal connectors consisting of a single strap that wraps over the top of the truss/rafter and is secured with a minimum of 2 nails on the front side and a minimum of 1 nail on the opposing side.
   - ☐ D. Double Wraps
     - ☐ Metal Connectors consisting of 2 separate straps that are attached to the wall frame, or embedded in the bond beam, on either side of the truss/rafter where each strap wraps over the top of the truss/rafter and is secured with a minimum of 2 nails on the front side, and a minimum of 1 nail on the opposing side, **or**
     - ☐ Metal connectors consisting of a single strap that wraps over the top of the truss/rafter, is secured to the wall on both sides, and is secured to the top plate with a minimum of three nails on each side.
   - ☐ E. Structural Anchor bolts structurally connected or reinforced concrete roof.
   - ☐ F. Other: _____
   - ☐ G. Unknown or unidentified
   - ☐ H. No attic access

5. **Roof Geometry:** What is the roof shape? (Do not consider roofs of porches or carports that are attached only to the fascia or wall of the host structure over unenclosed space in the determination of roof perimeter or roof area for roof geometry classification).
   - ☐ A. Hip Roof Hip roof with no other roof shapes greater than 10% of the total roof system perimeter. Total length of non-hip features: _____ feet; Total roof system perimeter: _____ feet
   - ☐ B. Flat Roof Roof on a building with 5 or more units where at least 90% of the main roof area has a roof slope of less than 2:12. Roof area with slope less than 2:12 _____ sq ft; Total roof area _____sq ft
   - ☒ C. Other Roof Any roof that does not qualify as either (A) or (B) above.

6. **Secondary Water Resistance (SWR):** (standard underlayments or hot-mopped felts do not qualify as an SWR)
   - ☐ A. SWR (also called Sealed Roof Deck) Self-adhering polymer modified-bitumen roofing underlayment applied directly to the sheathing or foam adhesive SWR barrier (not foamed-on insulation) applied as a supplemental means to protect the dwelling from water intrusion in the event of roof covering loss.
   - ☐ B. No SWR.
   - ☒ C. Unknown or undetermined.

Inspectors Initials RP **Property Address** 4939 Floramar Terrace New Port Richey, Fl. 34652

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7. **Opening Protection:** What is the **weakest** form of wind borne debris protection installed on the structure? **First**, use the table to determine the weakest form of protection for each category of opening. **Second**, (a) check one answer below (A, B, C, N, or X) based upon the lowest protection level for ALL Glazed openings **and** (b) check the protection level for all Non-Glazed openings (.1, .2, or .3) as applicable.

Opening Protection Level Chart Place an "X" in each row to identify all forms of protection in use for each opening type. Check only one answer below (A thru X), based on the weakest form of protection (lowest row) for any of the Glazed openings and indicate the weakest form of protection (lowest row) for Non-Glazed openings.		Glazed Openings				Non-Glazed Openings	
		Windows or Entry Doors	Garage Doors	Skylights	Glass Block	Entry Doors	Garage Doors
N/A	Not Applicable- there are no openings of this type on the structure		X	X	X		X
A	Verified cyclic pressure & large missile (9-lb for windows doors/4.5 lb for skylights)						
B	Verified cyclic pressure & large missile (4-8 lb for windows doors/2 lb for skylights)						
C	Verified plywood/OSB meeting Table 1609.1.2 of the FBC 2007						
D	Verified Non-Glazed Entry or Garage doors indicating compliance with ASTM E 330, ANSI/DASMA 108, or PA/TAS 202 for wind pressure resistance						
N	Opening Protection products that appear to be A or B but are not verified						
	Other protective coverings that cannot be identified as A, B, or C						
X	No Windborne Debris Protection	X				X	

☐ **A. Exterior Openings Cyclic Pressure and 9-lb Large Missile (4.5 lb for skylights only)** All Glazed openings are protected at a minimum, with impact resistant coverings or products listed as wind borne debris protection devices in the product approval system of the State of Florida or Miami-Dade County and meet the requirements of one of the following for "Cyclic Pressure and Large Missile Impact" (Level A in the table above).

- Miami-Dade County PA 201, 202, **and** 203
- Florida Building Code Testing Application Standard (TAS) 201, 202, **and** 203
- American Society for Testing and Materials (ASTM) E 1886 **and** ASTM E 1996
- Southern Standards Technical Document (SSTD) 12
- For Skylights Only: ASTM E 1886 **and** ASTM E 1996
- For Garage Doors Only: ANSI/DASMA 115

☐ A.1 All Non-Glazed openings classified as A in the table above, or no Non-Glazed openings exist

☐ A.2 One or More Non-Glazed openings classified as Level D in the table above, and no Non-Glazed openings classified as Level B, C, N, or X in the table above

☐ A.3 One or More Non-Glazed Openings is classified as Level B, C, N, or X in the table above

☐ **B. Exterior Opening Protection- Cyclic Pressure and 4 to 8-lb Large Missile (2-4.5 lb for skylights only)** All Glazed openings are protected, at a minimum, with impact resistant coverings or products listed as windborne debris protection devices in the product approval system of the State of Florida or Miami-Dade County and meet the requirements of one of the following for "Cyclic Pressure and Large Missile Impact" (Level B in the table above):

- ASTM E 1886 **and** ASTM E 1996 (Large Missile – 4.5 lb.)
- SSTD 12 (Large Missile – 4 lb. to 8 lb.)
- For Skylights Only: ASTM E 1886 **and** ASTM E 1996 (Large Missile - 2 to 4.5 lb.)

☐ B.1 All Non-Glazed openings classified as A or B in the table above, or no Non-Glazed openings exist

☐ B.2 One or More Non-Glazed openings classified as Level D in the table above, and no Non-Glazed openings classified as Level C, N, or X in the table above

☐ B.3 One or More Non-Glazed openings is classified as Level C, N, or X in the table above

☐ **C. Exterior Opening Protection- Wood Structural Panels meeting FBC 2007** All Glazed openings are covered with plywood/OSB meeting the requirements of Table 1609.1.2 of the FBC 2007 (Level C in the table above).

☐ C.1 All Non-Glazed openings classified as A, B, or C in the table above, or no Non-Glazed openings exist

☐ C.2 One or More Non-Glazed openings classified as Level D in the table above, and no Non-Glazed openings classified as Level N or X in the table above

☐ C.3 One or More Non-Glazed openings is classified as Level N or X in the table above

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☐ **N. Exterior Opening Protection (unverified shutter systems with no documentation)** All Glazed openings are protected with protective coverings not meeting the requirements of Answer "A", "B", or C" or systems that appear to meet Answer "A" or "B" with no documentation of compliance (Level N in the table above).

- ☐ N.1 All Non-Glazed openings classified as Level A, B, C, or N in the table above, or no Non-Glazed openings exist
- ☐ N.2 One or More Non-Glazed openings classified as Level D in the table above, and no Non-Glazed openings classified as Level X in the table above
- ☐ N.3 One or More Non-Glazed openings is classified as Level X in the table above

☒ **X. None or Some Glazed Openings** One or more Glazed openings classified and Level X in the table above.

MITIGATION INSPECTIONS MUST BE CERTIFIED BY A QUALIFIED INSPECTOR.
Section 627.711(2), Florida Statutes, provides a listing of individuals who may sign this form.

Qualified Inspector Name:	License Type:	License or Certificate #:
Richard Pickle	residential contrtactor home inspector	CRC057977 HI#307
Inspection Company:		**Phone:**
Richard Pickle Ent, Inc.		813-843-8564

Qualified Inspector – I hold an active license as a: (check one)

- ☒ Home inspector licensed under Section 468.8314, Florida Statutes who has completed the statutory number of hours of hurricane mitigation training approved by the Construction Industry Licensing Board and completion of a proficiency exam.
- ☐ Building code inspector certified under Section 468.607, Florida Statutes.
- ☒ General, building or residential contractor licensed under Section 489.111, Florida Statutes.
- ☐ Professional engineer licensed under Section 471.015, Florida Statutes.
- ☐ Professional architect licensed under Section 481.213, Florida Statutes.
- ☐ Any other individual or entity recognized by the insurer as possessing the necessary qualifications to properly complete a uniform mitigation verification form pursuant to Section 627.711(2), Florida Statutes.

Individuals other than licensed contractors licensed under Section 489.111, Florida Statutes, or professional engineer licensed under Section 471.015, Florida Statutes, must inspect the structures personally and not through employees or other persons. Licensees under s.471.015 or s.489.111 may authorize a direct employee who possesses the requisite skill, knowledge, and experience to conduct a mitigation verification inspection.

I, Richard Pickle **(print name) am a qualified inspector and I personally performed the inspection or (*licensed contractors and professional engineers only*) I had my employee (_____) perform the inspection (print name of inspector) and I agree to be responsible for his/her work.**

Qualified Inspector Signature: Richard Pickle **Date:** 5/24/23

An individual or entity who knowingly or through gross negligence provides a false or fraudulent mitigation verification form is subject to investigation by the Florida Division of Insurance Fraud and may be subject to administrative action by the appropriate licensing agency or to criminal prosecution. (Section 627.711(4)-(7), Florida Statutes) The Qualified Inspector who certifies this form shall be directly liable for the misconduct of employees as if the authorized mitigation inspector personally performed the inspection.

Homeowner to complete: I certify that the named Qualified Inspector or his or her employee did perform an inspection of the residence identified on this form and that proof of identification was provided to me or my Authorized Representative.

Signature: _____ **Date:** _____

An individual or entity who knowingly provides or utters a false or fraudulent mitigation verification form with the intent to obtain or receive a discount on an insurance premium to which the individual or entity is not entitled commits a misdemeanor of the first degree. (Section 627.711(7), Florida Statutes)

The definitions on this form are for inspection purposes only and cannot be used to certify any product or construction feature as offering protection from hurricanes.

Inspectors Initials RP **Property Address** 4939 Floramar Terrace New Port Richey, Fl. 34652

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ADHERED SYSTEMS

TABLE OF CONTENTS

Revised: 12/04/2013, 01/24/2014

SECTION 1 - - - GENERAL

INTRODUCTION

The following is the information required to install the Duro-Last roofing system. Each installation should be in compliance with the detail drawings, instructions, material descriptions, and other information stated herein.

REQUIREMENTS

1. The Duro-Last roofing system must be installed by an authorized Duro-Last contractor.
2. The Duro-Last membrane must be installed over properly prepared decks/substrates. The decks/substrate must be compatible with the roofing membrane.
3. Perimeter edge termination details must include sealant as shown in the detail drawings included in this specification (i.e. FA3010, FA3030, FA3040, FA3110, FA3120, FA3500, FA3510, FA3560, FA6000 and FA6010). Any other type of edge termination must be approved in writing by Duro-Last, Inc. prior to installation.
4. The 2 or 4-inch vinyl gravel stop or vinyl drip edge cannot be used on Duro-Last fully adhered installations.
5. A Duro-Last Technical Representative must inspect the Duro-Last roofing system for compliance with the Duro-Last specifications before a commercial/industrial warranty is issued. Note: Duro-Last does not perform destructive testing unless visual inspection necessitates a need for further investigation.
6. All materials used in the installation of the Duro-Last roofing system must be products of Duro-Last, Inc. or accepted products as defined and described in the specification. Other materials must be accepted in writing by the Duro-Last Engineering Services Department prior to being used in the Duro-Last roofing system.
7. The Duro-Last contractor is responsible for following all applicable building, plumbing, and electrical codes.
8. For buildings 40 ft. (12 m) or taller and/or located within high wind zones (greater than 110 mph [177 km/h]) or special wind regions;
    a. The Duro-Last Engineering Services Department should be involved in determining the fastening requirements. Typically, the ASCE 7 Specification will be used to determine the fastening requirements. When appropriate, specifications set forth by entities such as FM Global, SPRI or State/Local Agencies will be utilized.
    b. The Peel Stop detail described in detail drawings FA9060 and FA9060A is required when the Duro-Last membrane is adhered to polyisocyanurate insulation board. The Peel Stop detail may also be required in other instances. Refer to “Membrane Installation” on page 10 and detail drawings FA9060 and FA9060A for requirements.
    c. It is the contractor’s responsibility to verify the accuracy of information provided to Duro-Last, including but not limited to pull test results, building height, and roof dimensions. Measurements used during the quotation phase of a project must be checked for accuracy by the installing contractor.
9. The maximum size deck sheet that may be installed is 52’-6” x 20’ (16 x 6 m).
10. The maximum length of parapet flashing to be fully adhered is 50 ft. (15 m).
11. To be eligible for any of the Duro-Last 20 year warranties, the following criteria must be met.
    a. Complete the “20-Year Fully Adhered Project Approval” form and submit to Engineering Dept.
    b. Duro-Last membrane must have a thickness of 50 mil or greater.
    c. An approved cover board such as Duro-Guard ISO HD, DensDeck Prime® or SECUROCK® Gypsum-Fiber Roof Board must be used.

TOOLS

The authorized Duro-Last contractor should have the following tools, which are necessary for the efficient and proper installation of the Duro-Last roofing system.

Revised: 12/04/2013, 01/24/2014

• Safety Equipment (such as fall protection)	• Equipment necessary to raise materials to the rooftop
• Hand welders (hot-air) with a spare heating element (Optional: Automatic welder)	• Silicone hand roller
• Extension cords - cord length of 100' (30 m), #12/3 wire w/ground	• Ground fault interrupter
• Variable speed power screw driver with reverse	• P-3 screwdriver tips for screws
• Electric hammer drill w/depth gauge	• R-3 square drive tips for concrete screws
• Metal snips, hacksaw, keyhole saw, hammers, scissors, utility knives with retractable blades	• Measuring tapes (100' and 25') (30 and 7.5 m), chalk line, markers, lumber crayon
• 2-inch (50 mm) flat chisels, pry bar	• Vise clamps, nail aprons, caulk gun, screw drivers
• Tack claw	• Ladders
• Tarps	• Pull tester
• Core cutter	• Panduit bander
• Detergent-based cleaning fluid and rags	• Paint rollers
• Push Brooms / Heavy duty squeegee	

MEMBRANE DESCRIPTION

1. The Duro-Last membrane is a polyvinylchloride polymer blend, which is reinforced with a high-strength weft-inserted polyester scrim that has a thread pattern of 18 x 14 threads per inch. Refer to the Spec Data Sheets in the "Product Data Sheets" section for a listing of all of the test results and physical properties of the membrane.
2. The 40 mil (1 mm) thick membrane has a system weight of approximately 0.25 lb/ft^2 (1.2 kg/m^2). The roof cover is prefabricated using hot-air weld and supplied in sections rolled on carpet tubes. Individual sections may be as large as 52'-6" x 20' (16 x 6 m). The maximum length of parapet flashing to be fully adhered is 50 ft. (15 m).
3. The 50 mil (1.27 mm) thick membrane has a system weight of approximately 0.32 lb/ft^2 (1.56 kg/m^2). The roof cover is prefabricated using hot-air weld and supplied in sections rolled on carpet tubes. Individual sections may be as large as 52'-6" x 20' (16 x 6 m). The maximum length of parapet flashing to be fully adhered is 50 ft. (15 m).
4. The 60 mil (1.52 mm) thick membrane has a system weight of approximately 0.39 lb/ ft^2 (1.9 kg/m^2). The roof cover is prefabricated using hot-air weld and supplied in sections rolled on carpet tubes. Individual sections may be as large as 52'-6" x 20' (16 x 6 m). The maximum length of parapet flashing to be fully adhered is 50 ft. (15 m).

APPLICABILITY

The Duro-Last roofing system consists of the Duro-Last membrane, fasteners, prefabricated corners, parapet flashings, stack flashings, curb flashings, and other related Duro-Last approved products. The Duro-Last roofing system consists of products manufactured by Duro-Last, Inc., or accepted products as defined and described in the specifications. Alternate materials must be pre-approved in writing by the Duro-Last Engineering Services Department prior to their use with the Duro-Last roofing system.

DRAINAGE/SLOPE

Duro-Last has found no adverse effects on its membrane because of a lack of positive drainage, however, good roofing practices incorporate the use of positive drainage for the safety of the structure. The installing contractor is responsible to make sure roof drainage meets local building code requirements.

WEATHER CONSIDERATIONS

The Duro-Last membrane is designed to perform in all types of weather. The Duro-Last membrane is regularly subjected to DSET, EMMAQUA Exposure and low temperature cracking (ASTM D-2136) testing. Installation of the fully adhered Duro-Last membrane is subject to temperature limitations above 40º F (4.5º C) for a period of 72 consecutive hours with no precipitation occurring. It is Duro-Last's recommendation that installation be performed within the temperature range of 40 to 115º F (4.5 to 46º C).

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DELIVERY

A complete Duro-Last roofing system and related materials will be delivered to the location designated by the Duro-Last contractor in the original packaging and with shipping labels intact. Containers will be labeled with manufacturers/supplier's name, product name, and identification. Each shipment should be checked for damages and/or shortages at the time of delivery. The freight agent must note damaged materials and/or shortages on the freight bill. Concealed damage must be reported to the freight agent immediately. Materials damaged in shipping, handling, or storage cannot be used.

HANDLING

Once the Duro-Last roofing system is delivered, the contractor and contractor's crew are responsible for all handling and installation of the roofing system. Adequate personnel and equipment should be available to safely lift and place the Duro-Last roofing system onto the rooftop. Folded or rolled prefabricated sections of membrane must be placed on the roof near load-bearing members, and in a manner convenient to final placement.

STORAGE

Duro-Last materials should be kept clean and dry. Materials should be stored on pallets and covered with tarps. Care should be taken to place materials away from areas where water may pond or areas that water falls onto from higher elevations. All sealants and adhesives must be stored at temperatures above 40° F (5° C). Keep combustible materials away from heat, sparks, and open flames. Follow precautions outlined on the containers or supplied by the material manufacturer.

SUBSTRATE SEPARATION

The Duro-Last membrane is defect-free when it leaves the factory. Certain substrates are not compatible with the Duro-Last membrane and may cause premature failure of the membrane. These substrates are listed below.

Acrylic Coatings	Extruded Polystyrene	Modified Bitumen	Shingles
Aluminum Coated Asphalt	Granulated Cap Sheet	Old Duro-Last Roofs	TPO (Thermoplastic Polyolefin)
Coated or Smooth Asphalt	Hypalon (CSPE)	Polyurethane	Sprayed Urethane Foam
Expanded Polystyrene	Mineral Surfaced Cap	Coal Tar Pitch	PVC/CPA Membranes

The Duro-Last membrane is compatible with the following substrates, and no separation is required.

Polyisocyanurate Insulation Boards	GP DensDeck™ and DensDeck™ Primed	Glass Fiber Board
Wood Decks	Smooth Structural Concrete Decks	Cellular Glass Boards
Gypsum	Smooth Pre-stressed Concrete Decks	

CHEMICAL RESISTANCE

Duro-Last membrane is resistant to the chemicals listed below. If any other chemicals are present on a particular roof, please contact the Engineering Services Department.

Acrylic Paint	Linseed Oil	Copper Sulfate	Lard (Animal Fats)
Latex Paint	Masonry Cleaner	Ferric Chloride	Phosphoric Acid
Fertilizer Solution	Muriatic Acid	Fiberglass Mat	Polypropylene
Fruit Juice	Oleic Acid	Furnace Residue	Zinc Chloride
Hydrogen Peroxide	Sodium Hydroxide	Detergent Solution	Bleach

PAINT APPLICATION

The Duro-Last membrane may be painted, although vinyl edging may not be painted. See the Chemical Resistance section for approved paint types for the membrane. If the vinyl edging is painted and causes damage to the edgings, Duro-Last, Inc. will not be held responsible for repair or replacement under the warranty. Should you have any questions, please contact the Duro-Last Quality Assurance Department.

VAPOR BARRIERS

Duro-Last recommends the use of vapor barriers, however it is the responsibility of the Duro-Last contractor of record to ensure that all applicable specifications, building codes, regulations and ordinances are complied with and followed. A roofing professional, such as a consultant or architect, should be utilized for correct roof system design prior to installing any roof system.

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SECTION 2 - - - QUALITY ASSURANCE

PRE-JOB INSPECTION

When recovering an existing roofing system, the authorized Duro-Last contractor is responsible to conduct an inspection of the proposed job site roof conditions to determine the needed fastener type and length, evaluate the moisture content of the existing roofing system, and to note damaged areas to be repaired prior to installation of the Duro-Last roofing system.

CORE CUTS

1. The Duro-Last contractor is responsible for performing a series of core cuts to determine and verify the above information. The Duro-Last contractor and/or building owner is responsible for the repair of all core cuts.
2. Duro-Last, Inc. does not approve the practice of roofing over existing roofing systems that contain excess water. Excess water is defined as water observed within a core cut or moisture squeezed from the core sample taken.
3. Duro-Last's post-installation warranty inspection does not check the moisture content of the substrate.

PULLOUT TESTS

1. Fastener pullout tests must be conducted on the roof deck with approved fasteners to verify the integrity of the deck and to establish fastening patterns that meet the requirements of Duro-Last specifications. Contact the Duro-Last Engineering Services Department with any questions.
2. It is the responsibility of the Duro-Last contractor to make sure pullout tests are performed on site. The tests can be performed by either the fastener manufacturer or the authorized Duro-Last contractor. The sections of decking where integrity is in question should be the locations for the tests. The pullout tests must be documented on a roof drawing showing the location and pullout value of each test. In situations where new construction prevents on-site pullout tests, a pre-assembled deck representing the proposed deck type should be constructed and tested.
3. The number of pullout tests required will be as follows: perform a minimum of 10 tests for up to 50,000 ft^2 (4,645 m^2) and five additional pull tests for each additional 50,000 ft^2 or portion thereof, on each project. Areas of low pullout results will require additional pullout tests.
4. It is the responsibility of the Duro-Last contractor to verify pullout values prior to installation.

FASTENER SELECTION AND DECK TYPES

The fasteners used to attach insulation, recover board and Duro-Last membrane must be supplied by Duro-Last, Inc. The following tables summarize the appropriate fasteners to use for different deck types and system components. If a fastener type is needed that is not listed below, the Duro-Last Engineering Services Department must approve its use, in writing, prior to installation.

Plate Selection

When determining which plates to use and where to use them, refer to this table.

	2-inch (50 mm) Poly-Plate	2.4-inch (61 mm) Cleat Metal Plate	3-inch (76 mm) Square Metal Plate	Insulation Plate
Membrane Fastening				
Peel Stop*	No	Yes	Yes	No
Parapet Flashings	Yes	Yes	Yes	No
Base of Walls/Penetrations	Yes	Yes	Yes	No
Insulation Boards	No	No	Yes **	No
Cover Boards	No	No	Yes **	No

* Refer to detail drawing FA9060 for peel stop requirements.

** 3-inch Square Metal Plates must be used to fasten insulation and cover boards when Duro-Last membranes are adhered.

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Fastener Selection Based on Deck Type

When determining which fastener type to use for a specific deck type, refer to this table.

Deck Type	Fastener Type	Notes
Steel	Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck.
Wood	Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck.
Structural Concrete	Duro-Last Concrete Nail Duro-Last Concrete Screw Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck. Pre-drill a minimum of 1/2-inch (12.7 mm) deeper than the required depth of the fasteners using a 3/16-inch (5 mm) bit.
Gypsum	Auger Fastener* Liquid Auger Fastener**	Pre-drill required for auger fasteners. Use a 7/16–9/16-inch (11 – 14mm) bit.
		* Must penetrate a minimum of 1-1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Augers must penetrate a minimum of 2-inch (50 mm) from the top surface of the deck.
Cementitious Wood Fiber (Tectum)	Auger Fastener* Liquid Auger Fastener**	***Do not pre-drill.***
		* Must penetrate a minimum of 1 1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Auger must penetrate a minimum of 2-inch (50 mm) beyond the top surface of the deck.
Lightweight Concrete	Auger Fastener* Liquid Auger Fastener** Duro-Last Concrete Screw Duro-Last Concrete Nail Duro-Last HD Screws Duro-Last XHD Screws	Pre-drill required. Augers: Use a 7/16–9/16-inch (11 – 14 mm) bit. Others: Use a 3/16-inch (5 mm) bit.
		* Must penetrate a minimum of 1-1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Auger must penetrate a minimum of 2-inch (50 mm) from the top surface of the deck.
Walls and Curbs		Notes
Cinder and Concrete Block	Zinc Plated Metal Anchors Duro-Last Concrete Screw Duro-Last Concrete Nail Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface. Pre-drill a minimum of 1/2-inch (12.7 mm) deeper than the required depth of the fasteners using a 3/16-inch (5 mm) bit (1/2-inch (12.7 mm) for metal anchors).

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DECK / SUBSTRATE CRITERIA

APPROVED DECKS

1. Steel Deck:
   An approved substrate is required on steel decks. See the “Approved Insulation / Substrates” (page 8) section.
2. Poured Structural Concrete, Minimum 3,000 psi:
   If the concrete is structurally sound, clean, smooth, dry, free of sharp edges, dust, contaminants, oil, grease, and loose foreign material which may affect the installation of the roofing system and its performance, the Duro-Last membrane may be adhered directly to the poured-in-place concrete deck.
3. Precast/Prestressed Concrete Deck:
   If the concrete is structurally sound, clean, smooth, dry, free of sharp edges, dust, contaminants, oil, grease, and loose foreign material which may affect the installation of the roofing system and its performance, the Duro-Last membrane may be adhered directly to the precast/prestressed concrete deck. All joints between sections of concrete units must be grouted. Height variations from adjoining concrete units must be trowelled smooth.
4. Poured or Precast Gypsum:
   An approved substrate is required over gypsum decks. “Approved Insulation / Substrates” (page 8).
5. Lightweight Concrete:
   An approved substrate is required over lightweight concrete decks. See the “Approved Insulation / Substrates” (page 8). Lightweight concrete must be completely dry before installing the Duro-Last adhered assembly. Consult the lightweight concrete manufacturer for drying times.
6. Cementitious Wood Fiber Deck:
   An approved substrate is required over cementitious wood fiber decks. “Approved Insulation / Substrates” (page 8).
7. Plywood/OSB Deck - Minimum 15/32 inch:
   If the plywood is structurally sound, clean, smooth, dry, free of sharp edges, splinters, dust, contaminants, oil, grease, and loose foreign material which may affect the installation of the roofing system and its performance, the Duro-Last membrane may be adhered directly to the plywood deck. Gaps exceeding 1/4-inch wide in the plywood deck must be filled or covered with an approved substrate.
8. Lumber Deck Minimum 3/4 inch:
   If the lumber is structurally sound, clean, smooth, dry, free of sharp edges, splinters, dust, contaminants, oil, grease, and loose foreign material which may affect the installation of the roofing system and its performance, the Duro-Last membrane may be adhered directly to the lumber deck. Gaps exceeding 1/4-inch wide in the lumber deck must be filled or covered with approved filler. Height variations from adjoining lumber units must be feathered smooth.

NOTE: If the above listed decks do not meet the requirements for direct-to-deck adhesion, a Duro-Last approved substrate will be required. See the “Approved Insulation / Substrates” (page 8).

APPROVED INSULATION / SUBSTRATES

Polyisocyanurate Insulation

1. Must be installed in accordance with details FA9060 and FA9060A. These details are located at the end of this section.
2. Insulation must be Duro-Last-approved insulation for use with adhered single-ply membranes as identified in the current Factory Mutual Approval Guide.
3. The polyisocyanurate insulation must be a minimum of 2.0 PCF when tested in accordance with ASTM D-1621 and as certified by the insulation manufacturer.
4. On steel decks, use at least the minimum thickness required by the insulation manufacturer to span the flutes (1-inch [25 mm] minimum).
5. When attaching the insulation with fasteners and plates, 3-inch Square Metal Plates must be used.

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DensDeck® & Approved Recover Board

1. Must be installed in accordance with Detail Drawings FA9060 and FA9060A. These details are located at the end of this section.
2. Recover board must be a minimum of 1/4-inch (6.4 mm) thick for the fully adhered Duro-Last membrane.
3. On steel decks, use at least the minimum thickness required by the product manufacturer to span the flutes.
4. When attaching the insulation with fasteners and plates, 3-inch Square Metal Plates must be used.

NOTE: All other insulations and substrates must be approved by the Duro-Last Engineering Services Department.

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SECTION 3 - - - IMPLEMENTATION

SUBSTRATE PREPARATION

RECOVER – Existing Single-Ply Roofs

The building owner/representative and Duro-Last contractor must verify the conditions of the roof deck and the existing roof assembly. Deteriorated decking, wood blocking, insulation and all saturated materials must be removed and replaced.

1. A Duro-Last approved substrate board must be mechanically fastened over the existing assembly. See “Approved Insulation/Substrate” for more information.
2. The existing single-ply membrane must be cut free from the entire roof perimeter, cut free around all penetrations, and cut in between fastener rows prior to the installation of the Duro-Last membrane. When reroofing after a tear-off, caution should be used to prevent the Duro-Last membrane from contacting incompatible materials. (See "Substrate Separation”, page 4)
3. If the existing system is mechanically fastened, there is often a problem with loose fasteners. Because of this problem, cut the membrane open and remove all loose fasteners before installing the substrate board.
4. If a PVC membrane has been installed directly over styrene insulation without a separation sheet, then the old membrane must be removed. Damaged insulation must be replaced.

RECOVER – Existing Bitumen Roofing

The building owner/representative and Duro-Last contractor must verify the conditions of the roof deck and the existing roof assembly. Deteriorated decking, wood blocking, insulation and all saturated materials must be removed and replaced.

1. Gravel surface roofs must be leveled to ensure insulation lays flat. If the gravel is removed by power brooming or vacuuming, additional methods of leveling may be required to provide a suitable level surface for the recover board. **CAUTION**: Removing more than the loose gravel may affect the resulting fire rating. All blisters must be cut and fastened down or removed prior to the installation of the recover board.
2. Smooth or granular surface roofs. All blisters must be cut and fastened down or removed prior to the installation of the recover board.
3. A Duro-Last approved insulation (1-inch [25 mm] minimum) or substrate board must be installed over the existing roof system.

NEW CONSTRUCTION

The building owner/representative and Duro-Last contractor must ensure that the deck/substrate is structurally sound and meets standard industry construction practices prior to the application of the Duro-Last Roofing system.

INSTALLATION

WOOD NAILER

Wood nailers must be a #2 grade lumber, or better and must be fastened to the deck, wall or existing secured nailer in such a manner that they resist 180 lb. of force per linear foot (2,643 N/M) of nailer in any direction. Fasteners used to attach wood nailers must be spaced no greater than 18-inches (455 mm) apart. Wood nailers are required in any situation where 1-inch (25 mm) or greater of insulation is added to the roof perimeter edge. The top of the nailers must be flush with the top of the insulation. Wood nailers are not required at a change of plane such as the intersection between a parapet wall and the decking.

Duro-Last requires that for nailers and other lumber supports identified as ACQ or CA treated, only stainless steel fasteners be used. Additionally, for all new construction, untreated lumber should be used for nailers with standard e-coated fasteners. Further, treated lumber dating 2003 or earlier is acceptable for use with e-coated fasteners as lumber prior to 2003 is unlikely to contain the copper based treatments.

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INSULATION SELECTION AND INSTALLATION

1. Insulation products must be neatly fitted to the roof deck and its penetrations. Insulation boards should be installed tightly against adjacent insulation boards and all joints staggered 50% from row to row. No gap should exceed 1/4-inch (6.4 mm) in width. No more insulation products should be installed than can be covered with membrane and completed before the end of the day's work or before the onset of inclement weather.
2. When mechanically fastening insulation to the approved substrate, **a minimum of 250 lb. of pull out resistance per fastener is required. Special design consideration may be required if pull out resistance is less than the minimum 250 lb.** Duro-Last requires a minimum of 1 fastener for every 2 ft^2 (.19 m^2) of board in perimeter areas and 1 fastener for every 3.2 ft^2 (.3 m^2) of board in the field area. The width of the perimeter area is determined by either the lesser of .4 times the building height or .1 times the width of the roof, but must never be less than 4 ft. wide. Fasteners and stress distribution plates must be Duro-Last-approved for substrate attachment. 3" Square Metal Plates must be used when fastening insulation and cover boards. See detail drawings for insulation fastener spacing and patterns. See "FM Codes" section to determine the width of the perimeter enhancements needed from the roof edge.
3. Insulation attachment using low-rise foam is approved. See the "Product Data Sheet" found in this Duro-Last specification manual for approved products used for insulation attachment. Installation will be in compliance with the adhesive manufacturer recommendations and requirements. Contact the Duro-Last Engineering Services Department with any additional questions.
4. Polyisocyanurate attachment using hot (Type III or IV) asphalt must be in accordance with asphalt manufacturer's instruction and the NRCA and ARMA recommendations. The insulation must rest evenly on the approved deck/substrate so that there are no air spaces between the board and the deck/substrate. The maximum board size with hot asphalt attachment is 4 x 4 ft. Precautions should be used to protect the Duro-Last membrane from coming in contact with asphalt that has been pushed-up to the board surface. This can be accomplished by taping over the seams of the insulation boards. Remove all asphalt from the substrates before attaching the Duro-Last membrane. The following requirements must be met when attaching a polyisocyanurate board using hot asphalt:
    a. The proposed board must be compatible with the roof substrate, Duro-Last membrane and the hot asphalt used to attach the board.
    b. Insulation boards cannot be attached directly to steel decks with asphalt.
    c. Expanded or extruded polystyrene insulation must NOT be attached with asphalt.
    d. For alternative methods of board fastening, contact the Duro-Last Engineering Services Department.

ADHESIVE CONSIDERATIONS

1. The Duro-Last membrane must be adhered to the substrate with adhesive supplied by Duro-Last, Inc. Never thin the adhesive. The adhesive may be applied by using rollers. The adhesive must be applied in smooth even coats with no puddles or lumps. Adhesive must cover 100% of the substrate. Never apply adhesive in temperatures less than 50° F (5° C).
2. See the product data sheets for adhesive being used for coverage rates. Note that the actual coverage may vary depending upon the type of substrate and atmospheric conditions. Care should be taken when estimating the amount of adhesive that will be required to ensure that the adhesive is applied in amounts consistent with the coverage estimate.

MEMBRANE INSTALLATION

1. When Duro-Last membrane is adhered to polyisocyanurate, the peel stop detail FA9060 and FA9060A will be used. The peel stop detail must be installed on the exposed roof perimeter edge (roof edge with no adjacent wall or tie-ins) and installed 2'-0" (0.61 m) from the exterior roof edge regardless of parapet wall height. This includes roofs that are located within a main roof and exceed the height of the main roof by 3'-0" (0.91 m) or higher. Review the peel stop details FA9060 and FA9060A to determine when to use. Contact the Duro-Last Engineering Services Department for any additional information.
2. When projects are located in wind zones of 130 mph or greater, the membrane will be adhered to DensDeck® or approved recover boards and the use of details FA9060 and FA9060A, Option 3 is required.

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3. The surface of the deck/substrate must be inspected prior to the installation of the Duro-Last membrane. The deck/substrate must be clean, smooth, dry, and free of sharp edges, dust, contaminants, oil, grease, and loose, foreign material that may affect the installation of the roofing system and its performance. All damaged, broken or wet materials must be removed and replaced.
4. Refer to product data sheet for water based or solvent based adhesive for application details.
5. The membrane may be applied as described in the following steps. Application techniques may vary as long as the requirements described within this specification are met.
    a. Position the prefabricated roof section over the area to be covered. If roll goods are used, cut the sheets to length and allow material for edge termination where required.
    b. Fold the roof section back onto itself to expose half of the roof area to be covered by that section.
    c. Apply adhesive in front of the fold along its length. Be careful not to apply more of the adhesive than can be covered prior to the adhesive setting up. Start with moderate amounts of adhesive and adjust the amount as you get a feel for how fast the adhesive is setting up. Changing rooftop conditions throughout the day may affect the amount of time it takes adhesives to set up.
    d. Lift the top layer of membrane and, starting at the fold, use a stiff squeegee or broom to push the membrane into the adhesive. Care must be used to avoid wrinkles and air pockets. Apply the membrane to cover the adhesive that has been applied and then repeat steps “c” and “d” until the first half of the roof section is completed.
    e. Repeat steps “b”, “c” and “d” for the second half of the roof section.
    f. As each new roof section is added, overlap the adjacent sheets a minimum of 3 to 6-inches (51 to 152 mm).
    g. Be careful not to contaminate the membrane with adhesive where seams will be welded together.
    h. DO NOT THIN ADHESIVES.

HOT-AIR WELDING

1. Position the membrane so that the top membrane overlaps the bottom membrane a minimum of 4-inches (102 mm). Ensure the welding area is dry, clean and free of foreign material.
2. Weld the top membrane to the bottom membrane using a hand-held welder or an automatic welding machine, and silicone roller. A minimum 1-1/2-inch (38 mm) wide continuous weld is required.
3. All field-welded seams must be inspected with a tack claw or similar tool (cotter key extractor), and all deficiencies repaired prior to inspection by Duro-Last.

WALLS AND PENETRATIONS

The Duro-Last membrane may be adhered or mechanically fastened onto the walls. See details FA6000 and FA6010 for mechanically attached requirements. The previous sections which outlined acceptable products and proper substrate preparation, also apply to the walls.

1. Walls Mechanically Attached
    a. When mechanically attaching membrane to a parapet wall, position the deck sheet as shown in details FA6000 or FA6010, use separate parapet flashing as shown and install termination bar.
    b. When using detail FA6000, install a termination bar as shown. Order a separate wall flashing and add a minimum 6-inch skirt to the width of the wall flashing needed to cover the desired height (8-inch minimum above the membrane) and/or width of the wall. Weld the 6-inch skirt to the deck sheet membrane close to the termination bar.
    c. When using detail FA6010, order the parapet flashing with a skirt (skirt not to exceed 31-inches) to the width and height of the wall flashing to allow approximately 3 to 6 inches of skirt from the wall flashing to flash onto the deck sheet and weld the skirt as close to the termination bar as possible.
2. Walls Fully Adhered
    a. Adhesive must be applied to both the wall/substrate and to the membrane. See the product data sheets on the adhesive being used for coverage rates between both surfaces. The actual coverage may vary depending upon the type of substrate and atmospheric conditions.

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b. It is not acceptable to adhere the same sheet of membrane that is covering the roof deck to a wall. Instead, a separate sheet must be used and mechanical fasteners installed through one of the sheets at the roof-to-wall transition. This can be accomplished by ordering the wall sheet with a fastening tab at the base of the wall that will lie against either the wall or the roof deck/substrate.

c. The minimum height of termination of the wall sheet is 8-inches (203 mm) above the roof membrane. If the membrane will extend up the wall for more than 60-inches (1.5 m), a row of mechanical fasteners must be installed. The membrane must never extend up the wall more than 60-inches (1.5 m) without a row of fasteners. Refer to the appropriate detail drawings for information regarding the proper termination.

d. A row of mechanical fasteners are required at all transitions on the wall except at the top if the membrane will extend to the outside face of the wall. These rows of fasteners can be approved fasteners with the appropriate plate or termination bar, and installed through fastening tabs on prefabricated sheets.

e. It is recommended that wall sheets be kept small for easier handling. The installer may wish to install the membrane on the walls prior to installing on the roof deck. This will avoid potential problems with keeping the new membrane on the roof deck clean while working on the walls.

3. Roof Penetrations
   a. Mechanical fastening is required at all roof penetrations. These include, but are not limited to, pipes, drains, curbs, pitch pans, and expansion joints.
   b. The pullout resistance of the fasteners determines the fastener spacing of the transition points. To determine the spacing, refer to the pullout chart in the “Mechanically Fastened” section.

FLASHINGS

1. The Duro-Last membrane must not contact surfaces which maintain or exceed temperatures of 120° F including all insulated chimney pipes, exhaust pipes, and combustible fuel pipes.
2. All flashings, with the exception of pitch pans, must be terminated at a minimum of 8 inches above the roof surface. See “Pitch Pans” section for pitch pan installation criteria.

PITCH PANS

1. Use pitch pans only when standard Duro-Last flashings cannot be used.
2. Only Duro-Last Duro-Caulk Plus or approved sealer such as CSL may be used when creating a pitch pan.
3. All pitch pans must be terminated at a minimum of 4 inches above the roof surface.
4. See Details 4030, 4040 and 4045 for installation references.

TWO WAY AIR VENTS

1. The Duro-Last 2-way air vents are not required with a fully adhered application. Duro-Last reserves the right to incorporate their use if needed.

ROOF DRAINS AND SCUPPERS

1. Drain Assemblies with Clamping Rings
   a. All existing roofing materials must be removed from drain bowl and clamping ring.
   b. Use Duro-Caulk Plus between the membrane and bowl as shown in detail 2011 (1/2 tube minimum).
   c. After the Duro-Last membrane is properly installed onto the bowl and the clamping ring set in place, all bolts securing the ring must be installed to provide constant, even compression on the sealant. If bolts are broken or missing, replacements must be installed.
2. Duro-Last Drain Boots
   a. If the Duro-Last drain boot is to be used, apply one-half (1/2) tube of sealant minimum to the outside of the drain boot and insert it into the drain.
   b. Install composite compression drain rings as low into the drain as possible.
3. See Details 2011, 2020, 2021, 2025, 2030, 2041, 2050, 2060, 2061, 2070 and 2071 for installation references.

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EXPANSION JOINTS

1. See Details 1140, 1150, 1160, 1170 and 6160 for installation references.

WALKWAY PAD

1. Duro-Last Roof Trak® III Walkway Pad is recommended at all roof access points, service units and high traffic areas. The risk of potential third party damage to the Duro-Last roofing system may increase should the building owner choose not to utilize the Duro-Last Roof Trak III Walkway Pad. Note: Prior to inspection of the installation by Duro-Last, attach only one side of any Walkway Pads that will be covering any field seams. This will allow the Duro-Last Technical Representative to inspect the entire field seam. After the inspection, hot-air weld the remaining side to complete the attachment of the pad.

CAUTIONS AND WARNINGS

1. Duro-Last, Inc. is not responsible for damage that may occur as a result of moisture created from condensation occurring within or beneath a roof deck subassembly or building.
2. Duro-Last recommends the use of vapor barriers, however it is the responsibility of the Duro-Last contractor of record to ensure that all applicable specifications, building codes, regulations and ordinances are complied with and followed. A roofing professional, such as a consultant or architect, should be utilized for correct roof system design prior to installing any roof system.
3. Refer to the Material Safety Data Sheet (MSDS) prior to using any adhesive for information regarding the safe use of the product. It may be necessary to shut down air intake systems and block the intake vents to prevent fumes from entering the building.
4. Asphalt-based products are incompatible with the Duro-Last roofing membrane. Should the Duro-Last membrane become soiled with roofing asphalt, the affected membrane must be cleaned immediately, using approved cleaners and procedures. If the asphalt cannot be properly cleaned from the membrane, the affected membrane must be removed and new membrane installed. **Note: Extreme caution must be taken not to contaminate the roof area with loose asphalt.**
5. The Duro-Last membrane must not be in contact with substrates that maintain or exceed temperatures of 120° F, including all insulated chimney pipes and combustible fuel pipes. Refer to the appropriate detail drawings for information regarding the proper termination.
6. Duro-Last, Inc. does not approve the practice of roofing over existing roofing systems that contain excess water. This is water observed by taking core cuts, seeing standing water in the core or having water flowing into the cut, or squeezing the core sample and getting water droplets.
7. Phenolic foam is not an approved insulation in new construction or re-roofing applications. The Duro-Last roofing system may not, under any circumstance, be installed over phenolic foam.
8. Perlite and wood/mineral fiber-boards are not acceptable substrates for the Duro-Last membrane.
9. If asbestos is encountered, the building owner must be notified at once. The owner is solely responsible for determining the proper course of action.
10. A Duro-Last roof shall not be installed over areas of roofs if one or more of the following conditions exist:
    a. The building structure is not sufficient to handle the load of the completed system.
    b. It is not possible to find an approved fastener that will properly hold in the substrate.
    c. Roofs are subject to hot embers, slag, or burning debris.
    d. Incompatible chemicals exhausted directly onto the roof or may come in contact with the roof in liquid form. (See “Chemical Resistance”, page 4)
    e. Steam is exhausted directly onto the roof that is in excess of 120º F (49º C).

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SEA CASTLE


SEA CASTLE


33A CASTLE


TOW AWAY
ZONE


SEA CASTLE
SEA CASTLE

Roof Inspection Form

Applicant/Insured Name: Castle Council Inc Application/Policy #: _____

Address Inspected: 4939 Floramar Terrace New Port Richey, Fl. 34652

Date of Inspection: 5/24/23

This sample *Roof Inspection Form* (or a similar form) must be completed and signed by a Florida-licensed professional. The form will not be accepted without the dated signature of one of the following appropriately licensed inspectors:

- General, residential, building or roofing contractor
- Building code inspector
- Florida-licensed home inspector

Note: This form does not verify loss mitigation features. Use *Uniform Mitigation Verification Inspection Form* OIR-B1-1802.

Be advised that Underwriting will rely on the information in this sample form, or a similar form, that is obtained from the Florida licensed professional of your choice. This information is used only to determine insurability and is not a warranty or assurance of the suitability, fitness or longevity of the roof inspected.

Roof (Photos of each roof slope showing the roof's condition must be submitted with this form.)

Predominant Roof

Covering material: membrane

Roof age (years): 2023

Remaining useful life (years) 40

Date of last roofing permit: 2/3/23 23B00165

Date of last update: 2023

If updated (check one):

- [X] Full replacement
- [ ] Partial replacement

% of replacement: _____

Overall condition

- [X] Satisfactory
- [ ] Unsatisfactory **(explain below)**

Any visible signs of damage / deterioration?

(check all that apply and explain below)

- [ ] Cracking
- [ ] Cupping/curling
- [ ] Excessive granule loss
- [ ] Exposed asphalt
- [ ] Exposed felt
- [ ] Missing/loose/cracked tabs or tiles
- [ ] Soft spots in decking
- [ ] Visible hail damage

Any visible signs of leaks? [ ] Yes [X] No

Attic/underside of decking [ ] Yes [X] No

Interior ceilings [ ] Yes [X] No

Secondary Roof

Covering material: none

Roof age (years): _____

Remaining useful life (years) _____

Date of last roofing permit: _____

Date of last update: _____

If updated (check one):

- [ ] Full replacement
- [ ] Partial replacement

% of replacement: _____

Overall condition

- [ ] Satisfactory
- [ ] Unsatisfactory **(explain below)**

Any visible signs of damage / deterioration?

(check all that apply and explain below)

- [ ] Cracking
- [ ] Cupping/curling
- [ ] Excessive granule loss
- [ ] Exposed asphalt
- [ ] Exposed felt
- [ ] Missing/loose/cracked tabs or tiles
- [ ] Soft spots in decking
- [ ] Visible hail damage

Any visible signs of leaks? [ ] Yes [ ] No

Attic/underside of decking [ ] Yes [ ] No

Interior ceilings [ ] Yes [ ] No

Roof Inspection Form

Additional Comments/Observations (use additional pages as needed):

All *Roof inspection Forms* must be completed and signed by a verifiable Florida-licensed inspector.
I certify that the above statements are true and correct.

Inspector Signature	Title	License Number	Date
Richard Pickle	President	HI # 307	5/24/23
Richard Pickle Enterprises, Inc.	Residential Contractor Home Inspector	CRC057977 813--843-8564	
Company Name	License Type	Work Phone	

Special Instructions: This sample *Roof Inspection Form* includes the minimum data needed for Underwriting to properly evaluate a property application. While this specific form is not required, any other inspection report submitted for consideration must include at least this level of detail to be acceptable.

Photo Requirements

Photos must accompany each *Roof Inspection Form*. The minimum photo requirements include:

- Roof: Each slope
- **All** hazards or deficiencies

Documenting the Condition of Each System

The Florida-licensed inspector is required to certify the condition of the roofing system. *Acceptable Condition* means that each system is working as intended and there are no visible hazards or deficiencies.

Additional Comments or Observations

This section of the *Roof Inspection Form* must be completed with full details/descriptions if any of the following are noted on the inspection:

- Updates: Identify the types of updates, dates completed and by whom
- Any visible hazards or deficiencies
- Any roof determined not to be in good working order

Note to All Agents

The writing agent must review in advance each *Roof Inspection Form* submitted with an application for coverage. It is the agent's responsibility to ensure that all rules and requirements are met before the application is bound. Agents may not submit applications for properties with roof(s) not in good working order or with existing hazards/deficiencies.

ADHERED SYSTEMS

TABLE OF CONTENTS

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SECTION 1 - - - GENERAL

INTRODUCTION

The following is the information required to install the Duro-Last roofing system. Each installation should be in compliance with the detail drawings, instructions, material descriptions, and other information stated herein.

REQUIREMENTS

1. The Duro-Last roofing system must be installed by an authorized Duro-Last contractor.
2. The Duro-Last membrane must be installed over properly prepared decks/substrates. The decks/substrate must be compatible with the roofing membrane.
3. Perimeter edge termination details must include sealant as shown in the detail drawings included in this specification (i.e. FA3010, FA3030, FA3040, FA3110, FA3120, FA3500, FA3510, FA3560, FA6000 and FA6010). Any other type of edge termination must be approved in writing by Duro-Last, Inc. prior to installation.
4. The 2 or 4-inch vinyl gravel stop or vinyl drip edge cannot be used on Duro-Last fully adhered installations.
5. A Duro-Last Technical Representative must inspect the Duro-Last roofing system for compliance with the Duro-Last specifications before a commercial/industrial warranty is issued. Note: Duro-Last does not perform destructive testing unless visual inspection necessitates a need for further investigation.
6. All materials used in the installation of the Duro-Last roofing system must be products of Duro-Last, Inc. or accepted products as defined and described in the specification. Other materials must be accepted in writing by the Duro-Last Engineering Services Department prior to being used in the Duro-Last roofing system.
7. The Duro-Last contractor is responsible for following all applicable building, plumbing, and electrical codes.
8. For buildings 40 ft. (12 m) or taller and/or located within high wind zones (greater than 110 mph [177 km/h]) or special wind regions;
    a. The Duro-Last Engineering Services Department should be involved in determining the fastening requirements. Typically, the ASCE 7 Specification will be used to determine the fastening requirements. When appropriate, specifications set forth by entities such as FM Global, SPRI or State/Local Agencies will be utilized.
    b. The Peel Stop detail described in detail drawings FA9060 and FA9060A is required when the Duro-Last membrane is adhered to polyisocyanurate insulation board. The Peel Stop detail may also be required in other instances. Refer to “Membrane Installation” on page 10 and detail drawings FA9060 and FA9060A for requirements.
    c. It is the contractor’s responsibility to verify the accuracy of information provided to Duro-Last, including but not limited to pull test results, building height, and roof dimensions. Measurements used during the quotation phase of a project must be checked for accuracy by the installing contractor.
9. The maximum size deck sheet that may be installed is 52’-6” x 20’ (16 x 6 m).
10. The maximum length of parapet flashing to be fully adhered is 50 ft. (15 m).
11. To be eligible for any of the Duro-Last 20 year warranties, the following criteria must be met.
    a. Complete the “20-Year Fully Adhered Project Approval” form and submit to Engineering Dept.
    b. Duro-Last membrane must have a thickness of 50 mil or greater.
    c. An approved cover board such as Duro-Guard ISO HD, DensDeck Prime® or SECUROCK® Gypsum-Fiber Roof Board must be used.

TOOLS

The authorized Duro-Last contractor should have the following tools, which are necessary for the efficient and proper installation of the Duro-Last roofing system.

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• Safety Equipment (such as fall protection)	• Equipment necessary to raise materials to the rooftop
• Hand welders (hot-air) with a spare heating element (Optional: Automatic welder)	• Silicone hand roller
• Extension cords - cord length of 100' (30 m), #12/3 wire w/ground	• Ground fault interrupter
• Variable speed power screw driver with reverse	• P-3 screwdriver tips for screws
• Electric hammer drill w/depth gauge	• R-3 square drive tips for concrete screws
• Metal snips, hacksaw, keyhole saw, hammers, scissors, utility knives with retractable blades	• Measuring tapes (100' and 25') (30 and 7.5 m), chalk line, markers, lumber crayon
• 2-inch (50 mm) flat chisels, pry bar	• Vise clamps, nail aprons, caulk gun, screw drivers
• Tack claw	• Ladders
• Tarps	• Pull tester
• Core cutter	• Panduit bander
• Detergent-based cleaning fluid and rags	• Paint rollers
• Push Brooms / Heavy duty squeegee	

MEMBRANE DESCRIPTION

1. The Duro-Last membrane is a polyvinylchloride polymer blend, which is reinforced with a high-strength weft-inserted polyester scrim that has a thread pattern of 18 x 14 threads per inch. Refer to the Spec Data Sheets in the "Product Data Sheets" section for a listing of all of the test results and physical properties of the membrane.
2. The 40 mil (1 mm) thick membrane has a system weight of approximately 0.25 lb/ft^2 (1.2 kg/m^2). The roof cover is prefabricated using hot-air weld and supplied in sections rolled on carpet tubes. Individual sections may be as large as 52'-6" x 20' (16 x 6 m). The maximum length of parapet flashing to be fully adhered is 50 ft. (15 m).
3. The 50 mil (1.27 mm) thick membrane has a system weight of approximately 0.32 lb/ft^2 (1.56 kg/m^2). The roof cover is prefabricated using hot-air weld and supplied in sections rolled on carpet tubes. Individual sections may be as large as 52'-6" x 20' (16 x 6 m). The maximum length of parapet flashing to be fully adhered is 50 ft. (15 m).
4. The 60 mil (1.52 mm) thick membrane has a system weight of approximately 0.39 lb/ ft^2 (1.9 kg/m^2). The roof cover is prefabricated using hot-air weld and supplied in sections rolled on carpet tubes. Individual sections may be as large as 52'-6" x 20' (16 x 6 m). The maximum length of parapet flashing to be fully adhered is 50 ft. (15 m).

APPLICABILITY

The Duro-Last roofing system consists of the Duro-Last membrane, fasteners, prefabricated corners, parapet flashings, stack flashings, curb flashings, and other related Duro-Last approved products. The Duro-Last roofing system consists of products manufactured by Duro-Last, Inc., or accepted products as defined and described in the specifications. Alternate materials must be pre-approved in writing by the Duro-Last Engineering Services Department prior to their use with the Duro-Last roofing system.

DRAINAGE/SLOPE

Duro-Last has found no adverse effects on its membrane because of a lack of positive drainage, however, good roofing practices incorporate the use of positive drainage for the safety of the structure. The installing contractor is responsible to make sure roof drainage meets local building code requirements.

WEATHER CONSIDERATIONS

The Duro-Last membrane is designed to perform in all types of weather. The Duro-Last membrane is regularly subjected to DSET, EMMAQUA Exposure and low temperature cracking (ASTM D-2136) testing. Installation of the fully adhered Duro-Last membrane is subject to temperature limitations above 40º F (4.5º C) for a period of 72 consecutive hours with no precipitation occurring. It is Duro-Last's recommendation that installation be performed within the temperature range of 40 to 115º F (4.5 to 46º C).

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DELIVERY

A complete Duro-Last roofing system and related materials will be delivered to the location designated by the Duro-Last contractor in the original packaging and with shipping labels intact. Containers will be labeled with manufacturers/supplier's name, product name, and identification. Each shipment should be checked for damages and/or shortages at the time of delivery. The freight agent must note damaged materials and/or shortages on the freight bill. Concealed damage must be reported to the freight agent immediately. Materials damaged in shipping, handling, or storage cannot be used.

HANDLING

Once the Duro-Last roofing system is delivered, the contractor and contractor's crew are responsible for all handling and installation of the roofing system. Adequate personnel and equipment should be available to safely lift and place the Duro-Last roofing system onto the rooftop. Folded or rolled prefabricated sections of membrane must be placed on the roof near load-bearing members, and in a manner convenient to final placement.

STORAGE

Duro-Last materials should be kept clean and dry. Materials should be stored on pallets and covered with tarps. Care should be taken to place materials away from areas where water may pond or areas that water falls onto from higher elevations. All sealants and adhesives must be stored at temperatures above 40° F (5° C). Keep combustible materials away from heat, sparks, and open flames. Follow precautions outlined on the containers or supplied by the material manufacturer.

SUBSTRATE SEPARATION

The Duro-Last membrane is defect-free when it leaves the factory. Certain substrates are not compatible with the Duro-Last membrane and may cause premature failure of the membrane. These substrates are listed below.

Acrylic Coatings	Extruded Polystyrene	Modified Bitumen	Shingles
Aluminum Coated Asphalt	Granulated Cap Sheet	Old Duro-Last Roofs	TPO (Thermoplastic Polyolefin)
Coated or Smooth Asphalt	Hypalon (CSPE)	Polyurethane	Sprayed Urethane Foam
Expanded Polystyrene	Mineral Surfaced Cap	Coal Tar Pitch	PVC/CPA Membranes

The Duro-Last membrane is compatible with the following substrates, and no separation is required.

Polyisocyanurate Insulation Boards	GP DensDeck™ and DensDeck™ Primed	Glass Fiber Board
Wood Decks	Smooth Structural Concrete Decks	Cellular Glass Boards
Gypsum	Smooth Pre-stressed Concrete Decks	

CHEMICAL RESISTANCE

Duro-Last membrane is resistant to the chemicals listed below. If any other chemicals are present on a particular roof, please contact the Engineering Services Department.

Acrylic Paint	Linseed Oil	Copper Sulfate	Lard (Animal Fats)
Latex Paint	Masonry Cleaner	Ferric Chloride	Phosphoric Acid
Fertilizer Solution	Muriatic Acid	Fiberglass Mat	Polypropylene
Fruit Juice	Oleic Acid	Furnace Residue	Zinc Chloride
Hydrogen Peroxide	Sodium Hydroxide	Detergent Solution	Bleach

PAINT APPLICATION

The Duro-Last membrane may be painted, although vinyl edging may not be painted. See the Chemical Resistance section for approved paint types for the membrane. If the vinyl edging is painted and causes damage to the edgings, Duro-Last, Inc. will not be held responsible for repair or replacement under the warranty. Should you have any questions, please contact the Duro-Last Quality Assurance Department.

VAPOR BARRIERS

Duro-Last recommends the use of vapor barriers, however it is the responsibility of the Duro-Last contractor of record to ensure that all applicable specifications, building codes, regulations and ordinances are complied with and followed. A roofing professional, such as a consultant or architect, should be utilized for correct roof system design prior to installing any roof system.

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SECTION 2 - - - QUALITY ASSURANCE

PRE-JOB INSPECTION

When recovering an existing roofing system, the authorized Duro-Last contractor is responsible to conduct an inspection of the proposed job site roof conditions to determine the needed fastener type and length, evaluate the moisture content of the existing roofing system, and to note damaged areas to be repaired prior to installation of the Duro-Last roofing system.

CORE CUTS

1. The Duro-Last contractor is responsible for performing a series of core cuts to determine and verify the above information. The Duro-Last contractor and/or building owner is responsible for the repair of all core cuts.
2. Duro-Last, Inc. does not approve the practice of roofing over existing roofing systems that contain excess water. Excess water is defined as water observed within a core cut or moisture squeezed from the core sample taken.
3. Duro-Last's post-installation warranty inspection does not check the moisture content of the substrate.

PULLOUT TESTS

1. Fastener pullout tests must be conducted on the roof deck with approved fasteners to verify the integrity of the deck and to establish fastening patterns that meet the requirements of Duro-Last specifications. Contact the Duro-Last Engineering Services Department with any questions.
2. It is the responsibility of the Duro-Last contractor to make sure pullout tests are performed on site. The tests can be performed by either the fastener manufacturer or the authorized Duro-Last contractor. The sections of decking where integrity is in question should be the locations for the tests. The pullout tests must be documented on a roof drawing showing the location and pullout value of each test. In situations where new construction prevents on-site pullout tests, a pre-assembled deck representing the proposed deck type should be constructed and tested.
3. The number of pullout tests required will be as follows: perform a minimum of 10 tests for up to 50,000 ft^2 (4,645 m^2) and five additional pull tests for each additional 50,000 ft^2 or portion thereof, on each project. Areas of low pullout results will require additional pullout tests.
4. It is the responsibility of the Duro-Last contractor to verify pullout values prior to installation.

FASTENER SELECTION AND DECK TYPES

The fasteners used to attach insulation, recover board and Duro-Last membrane must be supplied by Duro-Last, Inc. The following tables summarize the appropriate fasteners to use for different deck types and system components. If a fastener type is needed that is not listed below, the Duro-Last Engineering Services Department must approve its use, in writing, prior to installation.

Plate Selection

When determining which plates to use and where to use them, refer to this table.

	2-inch (50 mm) Poly-Plate	2.4-inch (61 mm) Cleat Metal Plate	3-inch (76 mm) Square Metal Plate	Insulation Plate
Membrane Fastening				
Peel Stop*	No	Yes	Yes	No
Parapet Flashings	Yes	Yes	Yes	No
Base of Walls/Penetrations	Yes	Yes	Yes	No
Insulation Boards	No	No	Yes **	No
Cover Boards	No	No	Yes **	No

* Refer to detail drawing FA9060 for peel stop requirements.

** 3-inch Square Metal Plates must be used to fasten insulation and cover boards when Duro-Last membranes are adhered.

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Fastener Selection Based on Deck Type

When determining which fastener type to use for a specific deck type, refer to this table.

Deck Type	Fastener Type	Notes
Steel	Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck.
Wood	Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck.
Structural Concrete	Duro-Last Concrete Nail Duro-Last Concrete Screw Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface of deck. Pre-drill a minimum of 1/2-inch (12.7 mm) deeper than the required depth of the fasteners using a 3/16-inch (5 mm) bit.
Gypsum	Auger Fastener* Liquid Auger Fastener**	Pre-drill required for auger fasteners. Use a 7/16–9/16-inch (11 – 14mm) bit.
		* Must penetrate a minimum of 1-1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Augers must penetrate a minimum of 2-inch (50 mm) from the top surface of the deck.
Cementitious Wood Fiber (Tectum)	Auger Fastener* Liquid Auger Fastener**	***Do not pre-drill.***
		* Must penetrate a minimum of 1 1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Auger must penetrate a minimum of 2-inch (50 mm) beyond the top surface of the deck.
Lightweight Concrete	Auger Fastener* Liquid Auger Fastener** Duro-Last Concrete Screw Duro-Last Concrete Nail Duro-Last HD Screws Duro-Last XHD Screws	Pre-drill required. Augers: Use a 7/16–9/16-inch (11 – 14 mm) bit. Others: Use a 3/16-inch (5 mm) bit.
		* Must penetrate a minimum of 1-1/2-inch (38 mm) from the top surface of deck. * Factory Mutual designed systems require minimum of 2-inch (50 mm) penetration.
		** Liquid Auger must penetrate a minimum of 2-inch (50 mm) from the top surface of the deck.
Walls and Curbs		Notes
Cinder and Concrete Block	Zinc Plated Metal Anchors Duro-Last Concrete Screw Duro-Last Concrete Nail Duro-Last HD Screws Duro-Last XHD Screws	Must penetrate a minimum of 1-inch (25 mm) from the top surface. Pre-drill a minimum of 1/2-inch (12.7 mm) deeper than the required depth of the fasteners using a 3/16-inch (5 mm) bit (1/2-inch (12.7 mm) for metal anchors).

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DECK / SUBSTRATE CRITERIA

APPROVED DECKS

1. Steel Deck:
   An approved substrate is required on steel decks. See the “Approved Insulation / Substrates” (page 8) section.
2. Poured Structural Concrete, Minimum 3,000 psi:
   If the concrete is structurally sound, clean, smooth, dry, free of sharp edges, dust, contaminants, oil, grease, and loose foreign material which may affect the installation of the roofing system and its performance, the Duro-Last membrane may be adhered directly to the poured-in-place concrete deck.
3. Precast/Prestressed Concrete Deck:
   If the concrete is structurally sound, clean, smooth, dry, free of sharp edges, dust, contaminants, oil, grease, and loose foreign material which may affect the installation of the roofing system and its performance, the Duro-Last membrane may be adhered directly to the precast/prestressed concrete deck. All joints between sections of concrete units must be grouted. Height variations from adjoining concrete units must be trowelled smooth.
4. Poured or Precast Gypsum:
   An approved substrate is required over gypsum decks. “Approved Insulation / Substrates” (page 8).
5. Lightweight Concrete:
   An approved substrate is required over lightweight concrete decks. See the “Approved Insulation / Substrates” (page 8). Lightweight concrete must be completely dry before installing the Duro-Last adhered assembly. Consult the lightweight concrete manufacturer for drying times.
6. Cementitious Wood Fiber Deck:
   An approved substrate is required over cementitious wood fiber decks. “Approved Insulation / Substrates” (page 8).
7. Plywood/OSB Deck - Minimum 15/32 inch:
   If the plywood is structurally sound, clean, smooth, dry, free of sharp edges, splinters, dust, contaminants, oil, grease, and loose foreign material which may affect the installation of the roofing system and its performance, the Duro-Last membrane may be adhered directly to the plywood deck. Gaps exceeding 1/4-inch wide in the plywood deck must be filled or covered with an approved substrate.
8. Lumber Deck Minimum 3/4 inch:
   If the lumber is structurally sound, clean, smooth, dry, free of sharp edges, splinters, dust, contaminants, oil, grease, and loose foreign material which may affect the installation of the roofing system and its performance, the Duro-Last membrane may be adhered directly to the lumber deck. Gaps exceeding 1/4-inch wide in the lumber deck must be filled or covered with approved filler. Height variations from adjoining lumber units must be feathered smooth.

NOTE: If the above listed decks do not meet the requirements for direct-to-deck adhesion, a Duro-Last approved substrate will be required. See the “Approved Insulation / Substrates” (page 8).

APPROVED INSULATION / SUBSTRATES

Polyisocyanurate Insulation

1. Must be installed in accordance with details FA9060 and FA9060A. These details are located at the end of this section.
2. Insulation must be Duro-Last-approved insulation for use with adhered single-ply membranes as identified in the current Factory Mutual Approval Guide.
3. The polyisocyanurate insulation must be a minimum of 2.0 PCF when tested in accordance with ASTM D-1621 and as certified by the insulation manufacturer.
4. On steel decks, use at least the minimum thickness required by the insulation manufacturer to span the flutes (1-inch [25 mm] minimum).
5. When attaching the insulation with fasteners and plates, 3-inch Square Metal Plates must be used.

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DensDeck® & Approved Recover Board

1. Must be installed in accordance with Detail Drawings FA9060 and FA9060A. These details are located at the end of this section.
2. Recover board must be a minimum of 1/4-inch (6.4 mm) thick for the fully adhered Duro-Last membrane.
3. On steel decks, use at least the minimum thickness required by the product manufacturer to span the flutes.
4. When attaching the insulation with fasteners and plates, 3-inch Square Metal Plates must be used.

NOTE: All other insulations and substrates must be approved by the Duro-Last Engineering Services Department.

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SECTION 3 - - - IMPLEMENTATION

SUBSTRATE PREPARATION

RECOVER – Existing Single-Ply Roofs

The building owner/representative and Duro-Last contractor must verify the conditions of the roof deck and the existing roof assembly. Deteriorated decking, wood blocking, insulation and all saturated materials must be removed and replaced.

1. A Duro-Last approved substrate board must be mechanically fastened over the existing assembly. See “Approved Insulation/Substrate” for more information.
2. The existing single-ply membrane must be cut free from the entire roof perimeter, cut free around all penetrations, and cut in between fastener rows prior to the installation of the Duro-Last membrane. When reroofing after a tear-off, caution should be used to prevent the Duro-Last membrane from contacting incompatible materials. (See "Substrate Separation”, page 4)
3. If the existing system is mechanically fastened, there is often a problem with loose fasteners. Because of this problem, cut the membrane open and remove all loose fasteners before installing the substrate board.
4. If a PVC membrane has been installed directly over styrene insulation without a separation sheet, then the old membrane must be removed. Damaged insulation must be replaced.

RECOVER – Existing Bitumen Roofing

The building owner/representative and Duro-Last contractor must verify the conditions of the roof deck and the existing roof assembly. Deteriorated decking, wood blocking, insulation and all saturated materials must be removed and replaced.

1. Gravel surface roofs must be leveled to ensure insulation lays flat. If the gravel is removed by power brooming or vacuuming, additional methods of leveling may be required to provide a suitable level surface for the recover board. **CAUTION**: Removing more than the loose gravel may affect the resulting fire rating. All blisters must be cut and fastened down or removed prior to the installation of the recover board.
2. Smooth or granular surface roofs. All blisters must be cut and fastened down or removed prior to the installation of the recover board.
3. A Duro-Last approved insulation (1-inch [25 mm] minimum) or substrate board must be installed over the existing roof system.

NEW CONSTRUCTION

The building owner/representative and Duro-Last contractor must ensure that the deck/substrate is structurally sound and meets standard industry construction practices prior to the application of the Duro-Last Roofing system.

INSTALLATION

WOOD NAILER

Wood nailers must be a #2 grade lumber, or better and must be fastened to the deck, wall or existing secured nailer in such a manner that they resist 180 lb. of force per linear foot (2,643 N/M) of nailer in any direction. Fasteners used to attach wood nailers must be spaced no greater than 18-inches (455 mm) apart. Wood nailers are required in any situation where 1-inch (25 mm) or greater of insulation is added to the roof perimeter edge. The top of the nailers must be flush with the top of the insulation. Wood nailers are not required at a change of plane such as the intersection between a parapet wall and the decking.

Duro-Last requires that for nailers and other lumber supports identified as ACQ or CA treated, only stainless steel fasteners be used. Additionally, for all new construction, untreated lumber should be used for nailers with standard e-coated fasteners. Further, treated lumber dating 2003 or earlier is acceptable for use with e-coated fasteners as lumber prior to 2003 is unlikely to contain the copper based treatments.

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INSULATION SELECTION AND INSTALLATION

1. Insulation products must be neatly fitted to the roof deck and its penetrations. Insulation boards should be installed tightly against adjacent insulation boards and all joints staggered 50% from row to row. No gap should exceed 1/4-inch (6.4 mm) in width. No more insulation products should be installed than can be covered with membrane and completed before the end of the day's work or before the onset of inclement weather.
2. When mechanically fastening insulation to the approved substrate, **a minimum of 250 lb. of pull out resistance per fastener is required. Special design consideration may be required if pull out resistance is less than the minimum 250 lb.** Duro-Last requires a minimum of 1 fastener for every 2 ft^2 (.19 m^2) of board in perimeter areas and 1 fastener for every 3.2 ft^2 (.3 m^2) of board in the field area. The width of the perimeter area is determined by either the lesser of .4 times the building height or .1 times the width of the roof, but must never be less than 4 ft. wide. Fasteners and stress distribution plates must be Duro-Last-approved for substrate attachment. 3" Square Metal Plates must be used when fastening insulation and cover boards. See detail drawings for insulation fastener spacing and patterns. See "FM Codes" section to determine the width of the perimeter enhancements needed from the roof edge.
3. Insulation attachment using low-rise foam is approved. See the "Product Data Sheet" found in this Duro-Last specification manual for approved products used for insulation attachment. Installation will be in compliance with the adhesive manufacturer recommendations and requirements. Contact the Duro-Last Engineering Services Department with any additional questions.
4. Polyisocyanurate attachment using hot (Type III or IV) asphalt must be in accordance with asphalt manufacturer's instruction and the NRCA and ARMA recommendations. The insulation must rest evenly on the approved deck/substrate so that there are no air spaces between the board and the deck/substrate. The maximum board size with hot asphalt attachment is 4 x 4 ft. Precautions should be used to protect the Duro-Last membrane from coming in contact with asphalt that has been pushed-up to the board surface. This can be accomplished by taping over the seams of the insulation boards. Remove all asphalt from the substrates before attaching the Duro-Last membrane. The following requirements must be met when attaching a polyisocyanurate board using hot asphalt:
    a. The proposed board must be compatible with the roof substrate, Duro-Last membrane and the hot asphalt used to attach the board.
    b. Insulation boards cannot be attached directly to steel decks with asphalt.
    c. Expanded or extruded polystyrene insulation must NOT be attached with asphalt.
    d. For alternative methods of board fastening, contact the Duro-Last Engineering Services Department.

ADHESIVE CONSIDERATIONS

1. The Duro-Last membrane must be adhered to the substrate with adhesive supplied by Duro-Last, Inc. Never thin the adhesive. The adhesive may be applied by using rollers. The adhesive must be applied in smooth even coats with no puddles or lumps. Adhesive must cover 100% of the substrate. Never apply adhesive in temperatures less than 50° F (5° C).
2. See the product data sheets for adhesive being used for coverage rates. Note that the actual coverage may vary depending upon the type of substrate and atmospheric conditions. Care should be taken when estimating the amount of adhesive that will be required to ensure that the adhesive is applied in amounts consistent with the coverage estimate.

MEMBRANE INSTALLATION

1. When Duro-Last membrane is adhered to polyisocyanurate, the peel stop detail FA9060 and FA9060A will be used. The peel stop detail must be installed on the exposed roof perimeter edge (roof edge with no adjacent wall or tie-ins) and installed 2'-0" (0.61 m) from the exterior roof edge regardless of parapet wall height. This includes roofs that are located within a main roof and exceed the height of the main roof by 3'-0" (0.91 m) or higher. Review the peel stop details FA9060 and FA9060A to determine when to use. Contact the Duro-Last Engineering Services Department for any additional information.
2. When projects are located in wind zones of 130 mph or greater, the membrane will be adhered to DensDeck® or approved recover boards and the use of details FA9060 and FA9060A, Option 3 is required.

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3. The surface of the deck/substrate must be inspected prior to the installation of the Duro-Last membrane. The deck/substrate must be clean, smooth, dry, and free of sharp edges, dust, contaminants, oil, grease, and loose, foreign material that may affect the installation of the roofing system and its performance. All damaged, broken or wet materials must be removed and replaced.
4. Refer to product data sheet for water based or solvent based adhesive for application details.
5. The membrane may be applied as described in the following steps. Application techniques may vary as long as the requirements described within this specification are met.
    a. Position the prefabricated roof section over the area to be covered. If roll goods are used, cut the sheets to length and allow material for edge termination where required.
    b. Fold the roof section back onto itself to expose half of the roof area to be covered by that section.
    c. Apply adhesive in front of the fold along its length. Be careful not to apply more of the adhesive than can be covered prior to the adhesive setting up. Start with moderate amounts of adhesive and adjust the amount as you get a feel for how fast the adhesive is setting up. Changing rooftop conditions throughout the day may affect the amount of time it takes adhesives to set up.
    d. Lift the top layer of membrane and, starting at the fold, use a stiff squeegee or broom to push the membrane into the adhesive. Care must be used to avoid wrinkles and air pockets. Apply the membrane to cover the adhesive that has been applied and then repeat steps “c” and “d” until the first half of the roof section is completed.
    e. Repeat steps “b”, “c” and “d” for the second half of the roof section.
    f. As each new roof section is added, overlap the adjacent sheets a minimum of 3 to 6-inches (51 to 152 mm).
    g. Be careful not to contaminate the membrane with adhesive where seams will be welded together.
    h. DO NOT THIN ADHESIVES.

HOT-AIR WELDING

1. Position the membrane so that the top membrane overlaps the bottom membrane a minimum of 4-inches (102 mm). Ensure the welding area is dry, clean and free of foreign material.
2. Weld the top membrane to the bottom membrane using a hand-held welder or an automatic welding machine, and silicone roller. A minimum 1-1/2-inch (38 mm) wide continuous weld is required.
3. All field-welded seams must be inspected with a tack claw or similar tool (cotter key extractor), and all deficiencies repaired prior to inspection by Duro-Last.

WALLS AND PENETRATIONS

The Duro-Last membrane may be adhered or mechanically fastened onto the walls. See details FA6000 and FA6010 for mechanically attached requirements. The previous sections which outlined acceptable products and proper substrate preparation, also apply to the walls.

1. Walls Mechanically Attached
    a. When mechanically attaching membrane to a parapet wall, position the deck sheet as shown in details FA6000 or FA6010, use separate parapet flashing as shown and install termination bar.
    b. When using detail FA6000, install a termination bar as shown. Order a separate wall flashing and add a minimum 6-inch skirt to the width of the wall flashing needed to cover the desired height (8-inch minimum above the membrane) and/or width of the wall. Weld the 6-inch skirt to the deck sheet membrane close to the termination bar.
    c. When using detail FA6010, order the parapet flashing with a skirt (skirt not to exceed 31-inches) to the width and height of the wall flashing to allow approximately 3 to 6 inches of skirt from the wall flashing to flash onto the deck sheet and weld the skirt as close to the termination bar as possible.
2. Walls Fully Adhered
    a. Adhesive must be applied to both the wall/substrate and to the membrane. See the product data sheets on the adhesive being used for coverage rates between both surfaces. The actual coverage may vary depending upon the type of substrate and atmospheric conditions.

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b. It is not acceptable to adhere the same sheet of membrane that is covering the roof deck to a wall. Instead, a separate sheet must be used and mechanical fasteners installed through one of the sheets at the roof-to-wall transition. This can be accomplished by ordering the wall sheet with a fastening tab at the base of the wall that will lie against either the wall or the roof deck/substrate.

c. The minimum height of termination of the wall sheet is 8-inches (203 mm) above the roof membrane. If the membrane will extend up the wall for more than 60-inches (1.5 m), a row of mechanical fasteners must be installed. The membrane must never extend up the wall more than 60-inches (1.5 m) without a row of fasteners. Refer to the appropriate detail drawings for information regarding the proper termination.

d. A row of mechanical fasteners are required at all transitions on the wall except at the top if the membrane will extend to the outside face of the wall. These rows of fasteners can be approved fasteners with the appropriate plate or termination bar, and installed through fastening tabs on prefabricated sheets.

e. It is recommended that wall sheets be kept small for easier handling. The installer may wish to install the membrane on the walls prior to installing on the roof deck. This will avoid potential problems with keeping the new membrane on the roof deck clean while working on the walls.

3. Roof Penetrations
   a. Mechanical fastening is required at all roof penetrations. These include, but are not limited to, pipes, drains, curbs, pitch pans, and expansion joints.
   b. The pullout resistance of the fasteners determines the fastener spacing of the transition points. To determine the spacing, refer to the pullout chart in the “Mechanically Fastened” section.

FLASHINGS

1. The Duro-Last membrane must not contact surfaces which maintain or exceed temperatures of 120° F including all insulated chimney pipes, exhaust pipes, and combustible fuel pipes.
2. All flashings, with the exception of pitch pans, must be terminated at a minimum of 8 inches above the roof surface. See “Pitch Pans” section for pitch pan installation criteria.

PITCH PANS

1. Use pitch pans only when standard Duro-Last flashings cannot be used.
2. Only Duro-Last Duro-Caulk Plus or approved sealer such as CSL may be used when creating a pitch pan.
3. All pitch pans must be terminated at a minimum of 4 inches above the roof surface.
4. See Details 4030, 4040 and 4045 for installation references.

TWO WAY AIR VENTS

1. The Duro-Last 2-way air vents are not required with a fully adhered application. Duro-Last reserves the right to incorporate their use if needed.

ROOF DRAINS AND SCUPPERS

1. Drain Assemblies with Clamping Rings
   a. All existing roofing materials must be removed from drain bowl and clamping ring.
   b. Use Duro-Caulk Plus between the membrane and bowl as shown in detail 2011 (1/2 tube minimum).
   c. After the Duro-Last membrane is properly installed onto the bowl and the clamping ring set in place, all bolts securing the ring must be installed to provide constant, even compression on the sealant. If bolts are broken or missing, replacements must be installed.
2. Duro-Last Drain Boots
   a. If the Duro-Last drain boot is to be used, apply one-half (1/2) tube of sealant minimum to the outside of the drain boot and insert it into the drain.
   b. Install composite compression drain rings as low into the drain as possible.
3. See Details 2011, 2020, 2021, 2025, 2030, 2041, 2050, 2060, 2061, 2070 and 2071 for installation references.

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EXPANSION JOINTS

1. See Details 1140, 1150, 1160, 1170 and 6160 for installation references.

WALKWAY PAD

1. Duro-Last Roof Trak® III Walkway Pad is recommended at all roof access points, service units and high traffic areas. The risk of potential third party damage to the Duro-Last roofing system may increase should the building owner choose not to utilize the Duro-Last Roof Trak III Walkway Pad. Note: Prior to inspection of the installation by Duro-Last, attach only one side of any Walkway Pads that will be covering any field seams. This will allow the Duro-Last Technical Representative to inspect the entire field seam. After the inspection, hot-air weld the remaining side to complete the attachment of the pad.

CAUTIONS AND WARNINGS

1. Duro-Last, Inc. is not responsible for damage that may occur as a result of moisture created from condensation occurring within or beneath a roof deck subassembly or building.
2. Duro-Last recommends the use of vapor barriers, however it is the responsibility of the Duro-Last contractor of record to ensure that all applicable specifications, building codes, regulations and ordinances are complied with and followed. A roofing professional, such as a consultant or architect, should be utilized for correct roof system design prior to installing any roof system.
3. Refer to the Material Safety Data Sheet (MSDS) prior to using any adhesive for information regarding the safe use of the product. It may be necessary to shut down air intake systems and block the intake vents to prevent fumes from entering the building.
4. Asphalt-based products are incompatible with the Duro-Last roofing membrane. Should the Duro-Last membrane become soiled with roofing asphalt, the affected membrane must be cleaned immediately, using approved cleaners and procedures. If the asphalt cannot be properly cleaned from the membrane, the affected membrane must be removed and new membrane installed. **Note: Extreme caution must be taken not to contaminate the roof area with loose asphalt.**
5. The Duro-Last membrane must not be in contact with substrates that maintain or exceed temperatures of 120° F, including all insulated chimney pipes and combustible fuel pipes. Refer to the appropriate detail drawings for information regarding the proper termination.
6. Duro-Last, Inc. does not approve the practice of roofing over existing roofing systems that contain excess water. This is water observed by taking core cuts, seeing standing water in the core or having water flowing into the cut, or squeezing the core sample and getting water droplets.
7. Phenolic foam is not an approved insulation in new construction or re-roofing applications. The Duro-Last roofing system may not, under any circumstance, be installed over phenolic foam.
8. Perlite and wood/mineral fiber-boards are not acceptable substrates for the Duro-Last membrane.
9. If asbestos is encountered, the building owner must be notified at once. The owner is solely responsible for determining the proper course of action.
10. A Duro-Last roof shall not be installed over areas of roofs if one or more of the following conditions exist:
    a. The building structure is not sufficient to handle the load of the completed system.
    b. It is not possible to find an approved fastener that will properly hold in the substrate.
    c. Roofs are subject to hot embers, slag, or burning debris.
    d. Incompatible chemicals exhausted directly onto the roof or may come in contact with the roof in liquid form. (See “Chemical Resistance”, page 4)
    e. Steam is exhausted directly onto the roof that is in excess of 120º F (49º C).

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TOW AWAY
ZONE


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