Cost Impact of 2017 FBC-EB § 707.3.2 Roof Diaphragm Reroofing Requirements

RINKER-CR-2018-105

Final Report

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Submitted to

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Executive Summary

This research provides an assessment of the cost impact of the of 2017 Florida Building Code (FBC) - Existing Building (EB) § 707.3.2 Roof Diaphragm Reroofing Requirements This research provides an assessment of the cost impact of the of 2017 Florida Building Code (FBC) - Existing Building (EB) § 707.3.2 Roof Diaphragm Reroofing Requirements under the provisions that require that the whole roof be replaced or strengthened where more than 50 percent of the roof diaphragm is removed in zones where the ultimate design wind speed exceeds 115 mph and the diaphragms and connections in their existing condition are not capable of resisting at least 75 percent of those wind loads.

Roofing subcontractor bid data were collected for six roof types (A-F) covering the base bid and three repair scenarios (A-C). Unit costs were also collected for partial roof replacement options. The collected data was used to make cost comparisons between different replacement scenarios among three roofing subcontractors and determine mean base bid costs and repair/replacement costs for three scenarios: enhanced fastening of the roof deck; roof-to-wall connections enhanced fastening; and entire roof deck replacement. In general, based solely on the three bids received, the wood deck system was the least costly system to bring in compliance with 2017 FBC-EB § 707.3.2, while the LWC on bar joists was the most expensive

Overview

This research provides an assessment of the cost impact of the of 2017 Florida Building Code (FBC) - Existing Building (EB) § 707.3.2 Roof Diaphragm Reroofing Requirements under the provisions that require that the whole roof be replaced or strengthened where more than 50 percent of the roof diaphragm is removed in zones where the ultimate design wind speed exceeds 115 mph and the diaphragms and connections in their existing condition are not capable of resisting at least 75 percent of those wind loads. The goal shall be to determine the practical feasibility of this code compliance requirement for roof repair. Figure 1 shows the general process used to conduct this research.

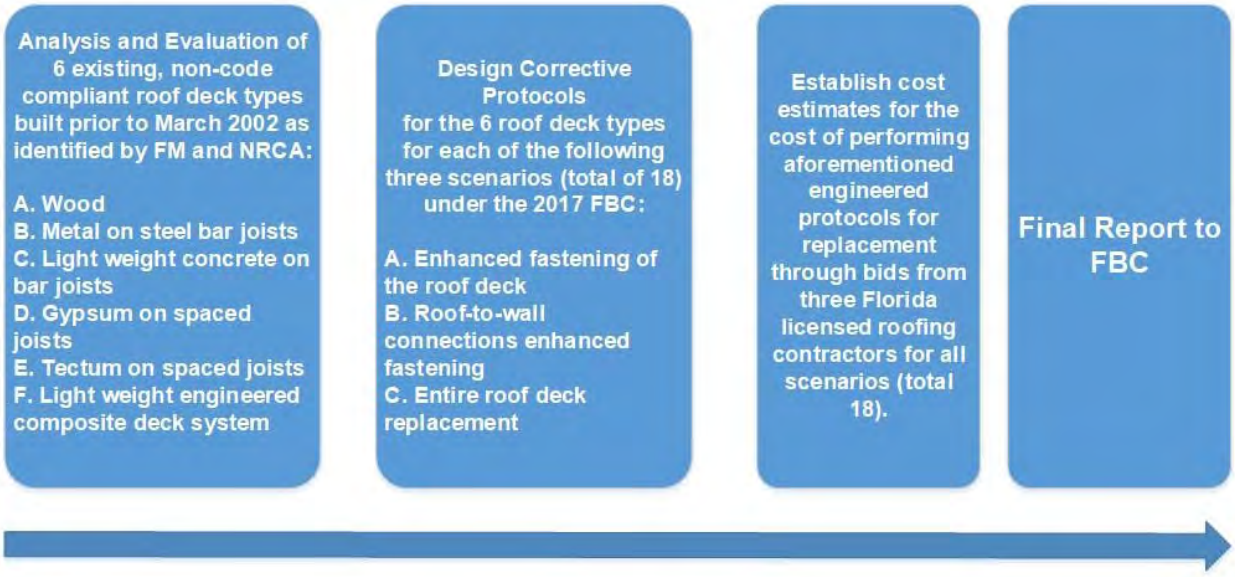

Figure 1. Research Plan

Relevant Sections of the 2017 FBC-EB (and related documents)

- 2017 FBC-EB § 707.3.2 Roof Diaphragm Reroofing Requirements:

> **[BS] 707.3.2 Roof diaphragms resisting wind loads in high-wind regions.** Where roofing materials are removed from more than 50 percent of the roof diaphragm or section of a building located where the ultimate design wind speed, V_{ult}, determined in accordance with Figure 1609.3(1) of the *Florida Building Code, Building,* is greater than 115 mph (51 m/s), as defined in Section 1609 (the High-Velocity Hurricane Zone shall comply with Section 1620) of the *Florida Building Code, Building*, roof diaphragms, connections of the roof diaphragm to roof framing members, and roof-to-wall connections shall be evaluated for the wind loads specified in the *Florida Building Code, Building*, including wind uplift. If the diaphragms and connections in their current condition are not capable of resisting at least 75 percent of those wind loads, they shall be replaced or strengthened in accordance with the loads specified in the *Florida Building Code, Building.*
> **Exceptions:**
> 1. This section does not apply to buildings permitted subject to the *Florida Building Code.*
> 2. This section does not apply to buildings permitted subject to the 1991 *Standard Building Code*, or later edition, or designed to the wind loading requirements of the ASCE 7-88 or later editions, where an evaluation is performed by a registered design professional to confirm the roof diaphragm, connections of the roof diaphragm to roof framing members, and roof-to-wall connections are in compliance with the wind loading requirements of either of these standards or later editions.
> 3. Buildings with steel or concrete moment resisting frames shall only be required to have the roof diaphragm panels and diaphragm connections to framing members evaluated for wind uplift.
> 4. This section does not apply to site-built single family dwellings. Site-built single-family dwellings shall comply with Sections 706.7 and 706.8.
> 5. This section does not apply to buildings permitted within the HVHZ after January 1, 1994 subject to the 1994 *South Florida Building Code,* or later editions, or where the building's wind design is based on the wind loading requirements of ASCE 7-88 or later editions.

Scope of Work

Task

1 Analysis and Evaluation of existing, non-code compliant roof deck types built prior to the year March 1, 2002 as identified by Factory Mutual (FM) and the National Roofing Contractor Association (NRCA) for this research:

A. Light weight concrete on bar joists

B. Wood

B. Metal on steel bar joists

D. Gypsum on spaced joists

E. Tectum on spaced joists

F. Light weight engineered composite deck system

2 Design corrective protocols for the six roof deck types as selected under Task 1 for each of the following three scenarios each (total of 18) under the 2017 FBC:

A. Enhanced fastening of the roof deck

B. Roof-to-wall connections enhanced fastening

C. Entire roof deck replacement

3 Establish cost estimates for the cost of performing aforementioned engineered protocols for replacement through bids from three Florida licensed roofing contractors for all scenarios (total 18).

Methodology

A prototype building with a 10,000 sqft. roof, as shown in Figure 1, was designed for the purpose of getting cost estimates from three contractors for the six roof types (A-F). The repair protocols and invitations to bid for the six roof types were developed by Quest Engineering. The bid documents are shown in the corresponding *Appendices A-F*.

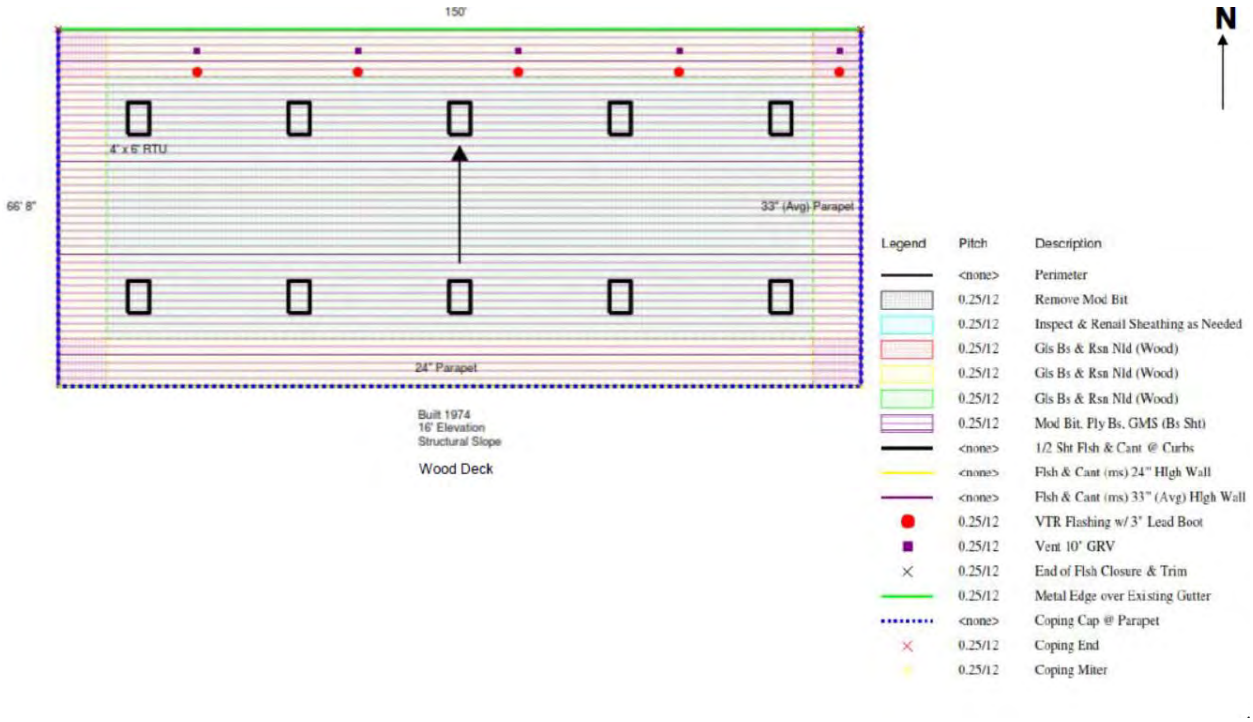

Figure 1. Roof design

Results

Tables 1-6 show the bid prices submitted by 3 roofing subcontractors for the six roof types (A-F). Table 7 shows the cost for each of the roof types covering the base bid and the three repair scenarios (A-C) and the percentage cost difference over the base bid. The cost are referenced to the bid prices submitted by each of the three roofing subcontractors (Bidders 1-3). The mean repair/replacement costs are listed in Table 8 and are also referenced to each of Bidders 1-3. The increase in cost for scenario A over the based bid ranged from 3.5% for the LWEC deck system to 21.3% for the LWC on bar joists. The increase in cost for scenario B over the base bid ranged from 1.9% for the wood deck system to 16.2% for the metal on steel bar joists. The increase in cost for scenario C over the base bid ranged from 23.3% for the wood deck system to 104.1% for the LWC on bar joists.

Table 1. Bid Prices – Light Weight Concrete on Bar Joists

Bid Prices – Light Weight Concrete on Bar Joists	Bidder 1	Bidder 2	Bidder 3
1. Base Bid for Roof Replacement	$129,940	$109,688	$138,000
2. Fee for Investigating Deck Attachment to Joist Supports • Cut and expose LWC on top side of deck at 4 locations (4' x 4' opening) to verify deck fastening	$2,000	$3,000	$5,400
3. Fee for Deck Re-fastening (where required) -Two #12 TEK screws per flute; screwed from joist top chord to deck underside Sidelap #10 screws screwed from deck underside at 12" o.c. Joists are spaced at 5' o.c. (i.e.) 31 Joists & 2 Bays	NO BID	$42,368	$14,610
4. Fee for Investigating Deck Edge Attachment • Cut and expose Drywall/drop-down ceiling along roof perimeter to verify deck edge fastening and Joist anchoring	NO BID	$1,500	$3,990
5. Additional Cost for Enhanced Edge and Support Connections • 434 linear feet of perimeter; 124 Joist Bearing Points • Install 3" x 3" x 1/4" deck ledger angle all along roof deck perimeter secured to wall with Φ ½" expansion anchor bolts at 24" o.c. (bolts to have minimum 4" embedment into filled cell of wall) and to each joist with two Φ 3/8" bolts and nuts.	$12,500 (If exposed)	$13,020	$15,200
6. Unit Cost for Partial Deck Replacement • Removal of existing lightweight concrete and disposal • Removal and disposal of metal decks • Grinding of welds/removal of screws • Replacement deck to be 22 ga. and match the profile of existing deck Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span) • Install ISO insulation to match LWC system thickness	$25/SF	$15.50/ SF *Excludes Interior Protector	$16/SF
7. Additional Cost for Full Deck Replacement • Removal and disposal of lightweight concrete and metal decks • Grinding of welds/removal of screws • Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B' • Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span) • Install 1.5" thick ISO insulation	$150,000	$135,000 *Excludes Interior Protector	$124,000
8. Associated Engineering Cost	$2,500	$1,000	$2,400

Table 2. Bid Prices – Wood Deck System

Bid Prices – Wood Deck System	Bidder 1	Bidder 2	Bidder3
1. Base Bid for Roof Replacement	$128,540	$105,931	$139,000
2. Fee for Investigating Truss Anchoring • Cut and expose Drywall/drop-down ceiling along roof perimeter to verify Truss anchoring	NO BID	$1,500	$2,200
3. Additional Cost for Enhanced Anchoring • 434 linear feet of perimeter; 304 Joist Bearing Points • Install 1-5/8" x 16 ga. Simpson hurricane straps at each truss bearing secured to tie beam/filled cell in masonry wall with five Φ 1/4'' tapcons (minimum 2" embedment concrete) and to each truss with five 10d nails	NO BID	$15,200	$14,960 Add to base
4. Additional Cost for Truss bracing (if required)	$4/LF	$50.00 each	$15/LF
5. Unit Cost for Deck Sheathing Replacement • Removal of damaged wood deck and its disposal • Replacement deck to be 5/8" plywood sheathing (trusses at 2' o.c.) • Sheathing to be secured to trusses with 8d nails at 6" o.c.	$3/SF	$6.00 per SF *Excludes Interior Protector	$6/SF
6. Added Cost for Full Sheathing Replacement • Removal of damaged wood deck and its disposal • Replacement deck to be 5/8" plywood sheathing (trusses at 2' o.c.) • Sheathing to be secured to trusses with 8d nails at 6" o.c.	$27,500	$40,000 *Excludes Interior Protection	$53,000 Add to base
7. Associated Engineering Cost	$2,500	$1,000	$2,400

Table 3. Bid Prices – Metal on Steel Bar Joists

Bid Prices – Metal on steel bar joists	Bidder 1	Bidder 2	Bidder3
1. Base Bid for Roof Replacement	$153,300	$128,773	$149,000
2. Fee for Investigating Deck Attachment to Joist Supports $ • Cut and expose roofing on top side of deck at 4 locations 4' x 4' opening) to verify deck fastening	$1,000	$3,000	$4,400
3. Fee for Deck Re-fastening (where required) -Two #12 TEK screws per flute; screwed in a 36/7 pattern • Sidelap #10 screws screwed from deck underside at 12" o.c. • Joists are spaced at 5' o.c. (i.e.) 31 Joists & 2 Bays	$3,000	$5,819	$5,425
4. Fee for Investigating Deck Edge Attachment • Cut and expose Drywall/drop-down ceiling along roof perimeter to verify deck edge fastening and Joist anchoring	NO BID	$1,500	$2,200
5. Additional Cost for Enhanced Edge and Support Connections • 434 linear feet of perimeter; 124 Joist Bearing Points • Install 3" x 3" x 1/4.." deck ledger angle all along roof deck perimeter secured to wall with Φ ½" expansion anchor bolts at 24" o.c. (bolts to have minimum 4" embedment into filled cell of wall) and to each joist with two Φ 3/8" bolts and nuts.	$12,500 (If exposed)	$13,020	$15,200
6. Unit Cost for Partial Deck Replacement • Removal and disposal of damaged metal decks • Grinding of welds/removal of screws • Replacement deck to be 22 ga. and match the profile of existing deck • Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)	$10/SF	$10.50 per SF * Excludes Interior Protection	$11/SF
7. Additional Cost for Full Deck Replacement • Removal and disposal of lightweight concrete and metal decks • Grinding of welds/removal of screws • Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B' • Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)	$75,000	$85,000 *Excludes Interior Protection	$72,150
8. Associated Engineering Cost	$2,500	$1,000	$2,400

Table 4. Bid Prices – Gypsum on Space Joists

Bid Prices – Gypsum on Space Joists	Bidder 1	Bidder 2	Bidder3
1. Base Bid for Roof Replacement	$129,940	$118,311	$143,000
2. Fee for Fastener Withdrawal Tests (TAS-105) • Cut, test and patch all test locations	$1,000	$400	$475
3. Fee for Investigating Deck Edge Attachment • Cut and expose Drywall/drop-down ceiling along roof perimeter to verify deck edge fastening and Joist anchoring	NO BID	$1,500	$2,200
4. Additional Cost for Enhanced Edge and Support Connections • 434 linear feet of perimeter; 124 Joist Bearing Points • Install 3" x 3" x 1/4" deck ledger angle all along roof deck perimeter secured to wall with Φ 1/2" expansion anchor bolts at 24" o.c. (bolts to have minimum 4" embedment into filled cell of wall) and to each joist with two Φ 3/8" bolts and nuts.	$12,500	$13,020	$15,200
5. Unit Cost for Partial Deck Replacement • Removal of damaged gypsum deck and its disposal • Grinding of welds/removal of bulb Ts • Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B' Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span) • Install ISO insulation to match Gypsum Deck thickness	$27.50/SF	$12.50 per SF *Excludes Interior Protection	$15/SF
6. Additional Cost for Full Deck Replacement • Removal and disposal of lightweight concrete and metal decks • Grinding of welds/removal of screws • Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B' • Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span) • Install 1.5” thick ISO insulation	$160,000	$105,000 *Excludes Interior Protection	$88,600
7. Associated Engineering Cost	$2,500	$1,000	$2,400

Table 5. Bid Prices – Tectum on Spaced Joists

Bid Prices – Tectum on Spaced Joists	Bidder 1	Bidder 2	Bidder3
1. Base Bid for Roof Replacement	$128,570	$118,311	$146,000
2. Fee for Fastener Withdrawal Tests (TAS-105) • Cut, test and patch all test locations	$1,000	$400	$475
3. Fee for Investigating Deck Edge Attachment • Cut and expose Drywall/drop-down ceiling along roof perimeter to verify deck edge fastening and Joist anchoring	NO BID	$1,500	$2,200
4. Additional Cost for Enhanced Edge and Support Connections • 434 linear feet of perimeter; 124 Joist Bearing Points • Install 3" x 3" x 1/4" deck ledger angle all along roof deck perimeter secured to wall with Φ 1/2" expansion anchor bolts at 24" o.c. (bolts to have minimum 4" embedment into filled cell of wall) and to each joist with two Φ 3/8" bolts and nuts.	$12,500	$13,020	$15,200
5. Unit Cost for Partial Deck Replacement • Removal of damaged cementitious wood fiber deck and its disposal • Grinding of welds/removal of tectum panel clips/runners • Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B' • Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span) • Install ISO insulation to match Tectum Deck thickness	$25/SF	$12.50 per SF *Excludes Interior Protection	$14
6. Additional Cost for Full Deck Replacement • Removal of cementitious wood fiber deck and its disposal • Grinding of welds/removal of tectum panel clips/runners • Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B' • Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span) Install 1.5" thick ISO insulation	$150,000	$105,000	$82,940
7. Associated Engineering Cost	$2,500	$1,000	$2,400

Table 6. Bid Prices – Light Weight Engineered Composite Deck System

Cost Proposal – Light Weight Engineered Composite Deck System	Bidder 1	Bidder 2	Bidder3
1. Base Bid for Roof Replacement	$128,540	$106,334	$141,000
2. Fee for Investigating Deck Thickness & Attachment to Joist Supports • Cut and expose LWC on top side of deck at 4 locations (4' x 4' opening) to verify deck fastening	$1,000	$3,000	$4,400
3. Fee for Fastener Withdrawal Tests (TAS-105) • Cut, test and patch all test locations	$1,000	$400	$475
4. Fee for Deck Re-fastening (where required) -Two #12 TEK screws per flute; screwed from joist top chord to deck underside Sidelap #10 screws screwed from deck underside at 12" o.c. Joists are spaced at 5' o.c. (i.e.) 31 Joists & 2 Bays	NO BID	$5,819	$5,425
5. Fee for Investigating Deck Edge Attachment • Cut and expose Drywall/drop-down ceiling along roof perimeter to verify deck edge fastening and Joist anchoring	NO BID	$1,500	$2,200
6. Additional Cost for Enhanced Edge and Support Connections • 434 linear feet of perimeter; 124 Joist Bearing Points • Install 3" x 3" x 1/4" deck ledger angle all along roof deck perimeter secured to wall with Φ ½" expansion anchor bolts at 24" o.c. (bolts to have minimum 4" embedment into filled cell of wall) and to each joist with two Φ 3/8" bolts and nuts.	$12,500 (If exposed)	$13,020	$15,200
7. Unit Cost for Partial Deck Replacement • Removal of existing composite boards and disposal • Removal and disposal of metal decks • Grinding of welds/removal of screws • Replacement deck to be 22 ga. and match the profile of existing deck • Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span) • Install ISO insulation and mineral board to match Composite system thickness	$25/SF	16.00 per SF * Excludes Interior Protection	$15/SF
8. Additional Cost for Full Deck Replacement • Removal and disposal of lightweight concrete and metal decks • Grinding of welds/removal of screws • Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B' • Replacement sheets should span minimum 15 feet (3 joist spacings) • Deck to be secured to joists in 36/7 pattern with #12 TEK screws • Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span) • Install 1.5" thick ISO insulation	$150,000	$140,000 *Excludes Interior Protection	$84,600
9. Associated Engineering Cost	$2,500	$1,000	$2,400

Table 7. Bid Prices for A-F Roof type and A-C Repair Scenarios[+*]

Repair	LWC on Bar Joists	Wood Deck System	Metal on Steel Bar Joists	Gypsum on Spaced Joists	Tectum on Spaced Joists	LWEC Deck System
Base Bid (incl. in A-C Repair Scenarios)	**1:**$129,940 **2:**$109,688 **3:**$138,000	**1:** $128,540 **2:** $105,931 **3:** $139,000	**1:** $153,300 **2:** $128,773 **3:** $149,000	**1:**$129,940 **2:**$118,311 **3:**$143,000	**1:**$128,570 **2:**$118,311 **3:**$146,000	**1:**$128,540 **2:**$106,334 **3:**$141,000
Bid Line No.	1	1	1	1	1	1
A. Enhanced fastening of the roof deck	**1:**$134,440+ **2:**$157,556 **3:**$164,400	NA	**1:**$156,800+ **2:** $140,092 **3:** $163,425	NA	NA	**1:**$133,040+ **2:**$118,753 **3:**$155,900
Bid Line Nos.	1,2,3,4 & 8	---------	1,2,3,4 & 8	---------	---------	1,2,3,4,5 & 9
B. Roof-to-wall connections enhanced fastening	**1:**$146,940+* **2:**$128,208 **3:**$164,990	**1:** $131,040+ **2:** $123,631 **3:** $158,560	**1:** $169,300+* **2:** $147,293 **3:** $173,200	**1:**$145,940+ **2:**$134,231 **3:**$134,575	**1:**$144,570+ **2:**$134,231 **3:**$179,075	**1:**$145,540+* **2:**$125,954 **3:**$165,675
Bid Line Nos.	1,2, 4,5 & 8	1, 2, 3 & 7	1,2,4,5 & 8	1,2,3,4 & 7	1,2,3,4 & 7	1,2,3,5,6 & 9
C. Entire roof deck replacement	**1:**$284,440+ **2:**$265,188* **3:**$173,790	**1:** $158,540+ **2:** $148,431* **3:** $196,600	**1:** $231,800+ **2:** $219,273* **3:** $230,150	**1:**$293,440+ **2:**$226,211* **3:**$207,795	**1:**$282,070+ **2:**$226,211* **3:**$246,815	**1:**$283,040+ **2:**$252,934* **3:**$235,075
Bid Line Nos.	1,2,4,7 & 8	1, 2, 6 &7	1,2, 4,7 & 8	1,2,3,6 & 7	1,2,3,6 & 7	1,2,3,5,8 & 9

+ = No Bid Items

*** = Condition/Exclusions**

Table 8. Mean Bid Prices for A-F Roof type and A-B Repair Scenarios[+*]

Repair	LWC on Bar Joists	Wood Deck System	Metal on Steel Bar Joists	Gypsum on Spaced Joists	Tectum on Spaced Joists	LWEC Deck System
Base Bid (incl. in A-C Repair Scenarios)	**1:** $129,940	**1:** $128,540	**3:** $149,000	**1:** $129,940	**1:** $128,570	**1:** $128,540
A. Enhanced fastening of the roof deck	**2:** $157,556	NA	**3:** $163,425	NA	NA	**1:** $133,040+
% Cost Increase over Base Bid	21.3 %	----	9.7%	----	----	3.5%
B. Roof-to-wall connections enhanced fastening	**1:** $146,940+*	**1:** $131,040+	**3:** $173,200	**1:** $134,575	**1:** $144,570+	**1:** $145,540+*
% Cost Increase over Base Bid	13.1%	1.9%	16.2%	3.6%	12.4%	13.2%
C. Entire roof deck replacement	**2:** $265,188*	**1:** $158,540+	**3:** $230,150	**2:** $226,211*	**3:** $246,815	**2:** $252,934*
% Cost Increase over Base Bid	104.1%	23.3%	54.5%	74.1%	92.0%	96.8%

+ = No Bid Items

*** = Condition/Exclusions**

Conclusions

Roofing subcontractor bid data were collected for six roof types (A-F) covering the base bid and three repair scenarios (A-C). Unit costs were also collected for partial roof replacement options. The collected data was used to make cost comparisons between different replacement scenarios among three roofing subcontractors and determine mean base bid costs and repair/replacement costs for three scenarios: enhanced fastening of the roof deck; roof-to-wall connections enhanced fastening; and entire roof deck replacement. In general, based solely on the three bids received, the wood deck system was the least costly system to bring in compliance with 2017 FBC-EB § 707.3.2, while the LWC on bar joists was the most expensive

Future work should address the following:

a. Setting minimum deck attachment criteria (similar to wood decks) and standardizing this for all NOA/Product Approval tests. This will eliminate non-applicability of approved products for several field conditions and streamline the roofing permitting process.
b. On properties valued over a certain threshold (say $500,000), requiring scenario B (roof to wall connections and enhanced edge supports) up to a pre-set percentage (say 15%) of re-roofing cost.
c. Conducting a cost impact analysis for future code changes, before implementation, except in the case of life and/or fire safety requirements.

APPENDIX A

MODIFIED BITUMEN ROOF SYSTEM OVER LIGHTWEIGHT CONCRETE DECK PROTOCOL

BID PACKAGE

for

RE-ROOF INSTALLATION (LWIC)

at

AMERICANA WAREHOUSE BUILDING
123 WASHINGTON AVENUE
ANYTOWN, FL - 33000

Prepared for

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

May 8, 2018

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INTRODUCTION

The subject property comprises of a warehouse building that was built in 1974. This 1-story warehouse building has a flat roof with lightweight concrete over a structural steel deck. The main flat roof is at an elevation of about 16 feet. The total roof area is approximately 10,000 sf. The main roof has a Modified Bitumen roof system over the lightweight concrete deck. This specification addresses the removal of the existing roof down to the lightweight concrete deck and the installation of a new CertainTeed Modified Bitumen roof system.

Quest Engineering Services & Testing, Inc. (QuEST) has prepared the following bid package for the new roof installation at the subject site. The new roof proposed is a CertainTeed Modified Bitumen SBS Roof System over Lightweight Concrete Decks. This roof system's Miami-Dade Notice of Acceptance No. is 14-0529.01 (Page 27 of 34, System Design Pressure -52.5 psf with Limitation #7). This system comprises of a mechanically attached Flexiglas Base Sheet, hot-mopped Flintlastic Poly SMS Ply Sheet and a hot-mopped Flintlastic GMS Cap Sheet.

SCOPE OF PROJECT

The scope of this project is to remove the existing roof down to the lightweight concrete deck, inspect, clean (and repair if necessary) the existing roof deck and then install the new roof system in accordance with the Florida Building Code (2017). Prior to commencement of the re-roofing contractor shall verify existing steel deck attachment and joist anchoring. Damaged deck areas will need to be repaired and/or replaced. As a part of the new roof installation, the membrane should be draped up and over the parapet walls and a new coping cap installed. The owner reserves the right to request post-installation bell chamber tests (TAS-124) to assure that roof system has been installed in an acceptable manner. Failing areas will need to be repaired and retested at contractor's expense, before acceptance.

As this project's aim is to generate a reliable bid as it pertains to deck diaphragm improvements required by the new Florida Building Code (2017) associated with re-roofing on old buildings that were designed with wind codes pre-dating ASCE 7-88, we have eliminated work associated with RTUs and/or its upgrades. The contractor must install CertainTeed and FBC approved flashing around all roof penetrations and equipment curbs.

For purposes of this research project, the existing lightweight concrete deck is assumed to have been sloped adequately to achieve positive drainage. As indicated in the attached drainage evaluation, the existing primary drains and emergency overflow scuppers are adequate. Ensure that these scuppers are positioned such that their bottoms are not less than 2" nor more than 4" above roof level. Care should be taken to ensure that ponding water in excess of 5" does not occur at any time at any portion of the roof.

The information provided in these specifications is for general informational purposes only. The contractor is responsible for obtaining a re-roofing permit and coordinating with the Building Department for all necessary in-progress and final inspections. All testing and engineering necessary to obtain a permit and complete this job are the also the contractor's responsibility.

The roof contractor must be certified by CertainTeed Corp to install this roof system. The contractor must provide a 20-year NDL warranty on labor and materials. All work should be done in accordance with the Florida Building Code (2017), including applicable HVHZ protocols. All installation, product and safety guidelines of the roof system manufacturer, along with OSHA mandated safety guidelines should be followed. In case of conflicts, the more stringent standard should be followed.

Safety and Clean-Up

The contractor, its employees, representatives, agents and sub-contractors should observe all safety precautions as required by OSHA during the entire duration of this project. The contractor should also clean-up on a daily basis. This is an occupied facility and contractor must maintain the site in a presentable fashion at all times.

Insurance Requirements

The roofing contractor must maintain all necessary licenses and insurance certificates throughout the duration of the job.

Mail Sealed Bids:

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

Ph (352) 222 6147 Fax (561) 245 4447

Deadline: Bid Packages must be received by **5:00 PM on May 15, 2018.**

All technical questions concerning this bid package may be addressed directly to Quest Engineering Services & Testing, Inc. If there are any technical questions, please contact:

R. N. Sailappan, P.E., *Quest Engineering Services & Testing, Inc.*, **Ph (954) 582 9800**

REROOFING SPECIFICATIONS

This section outlines the general guidelines for the bidding and reproofing at the subject site. The guidelines under the general sub-section apply to the entire project.

General

1. Only those bidders on the invited bidders list are eligible to bid on this project.

2. All bidders must be licensed in the State of Florida and have a minimum of 5 years of experience providing such services.

3. The bid should also identify the bidder's contact person and contact information.

4. All bidders should maintain appropriate licenses and insurance requirements during the entire project duration. The liability insurance policy should name AMPCO as additional insured. The minimum insurance requirements are as follow:

Workman's Compensation	-	Statutory Limits
General Liability & Property Damage	-	$1,000,000.00

5. The bid packages should include the following:

   a) Bidder's Contact Information
   b) Filled out Bid Form with Cost Proposal for Roof Replacement with breakdowns for all 3 facets, namely:

      Deck Re-fastening to satisfy new diaphragm shear enhancements
      Enhance Edge Connections to satisfy new diaphragm shear enhancements
      Deck Replacement to satisfy new diaphragm shear enhancements

REQUIRED SUBMITTALS BY SELECTED CONTRACTOR

A. Prior to starting work, the roofing contractor must submit the following:

1. Shop drawings showing layout, details of construction and identification of materials.

2. A sample of the manufacturer's Membrane System Warranty.

3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.

4. Certification of the manufacturer's warranty reserve.

B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

BID FORM

Contractor:

Date till which Price is Valid:

Cost Proposal:

1. Base Bid for Roof Replacement $ _____

2. Fee for Investigating Deck Attachment to Joist Supports $ _____
   Cut and expose LWC on top side of deck at 4 locations
   (4' x 4' opening) to verify deck fastening

3. Fee for Deck Re-fastening (where required) – Two #12 TEK
   screws per flute; screwed from joist top chord to deck underside $ _____
   Sidelap #10 screws screwed from deck underside at 12" o.c.
   Joists are spaced at 5' o.c. (i.e.) 31 Joists & 2 Bays

4. Fee for Investigating Deck Edge Attachment $ _____
   Cut and expose Drywall/drop-down ceiling along roof perimeter
   to verify deck edge fastening and Joist anchoring

5. Additional Cost for Enhanced Edge and Support Connections $ _____
   434 linear feet of perimeter; 124 Joist Bearing Points
   Install 3" x 3" x ¼" deck ledger angle all along roof deck perimeter
   secured to wall with Ø ½" expansion anchor bolts at 24" o.c.
   (bolts to have minimum 4" embedment into filled cell of wall) and
   to each joist with two Ø 3/8" bolts and nuts.

6. Unit Cost for Partial Deck Replacement $ _____
   Removal of existing lightweight concrete and disposal
   Removal and disposal of metal decks
   Grinding of welds/removal of screws
   Replacement deck to be 22 ga. and match the profile of existing deck
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)
   Install ISO insulation to match LWC system thickness

7. Additional Cost for Full Deck Replacement $ _____
   Removal and disposal of lightweight concrete and metal decks
   Grinding of welds/removal of screws
   Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B'
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)
   Install 1.5" thick ISO insulation

8. Associated Engineering Cost $ _____

All work will be done by licensed personnel after obtaining relevant permits, in accordance with the Florida Building Code (2017)

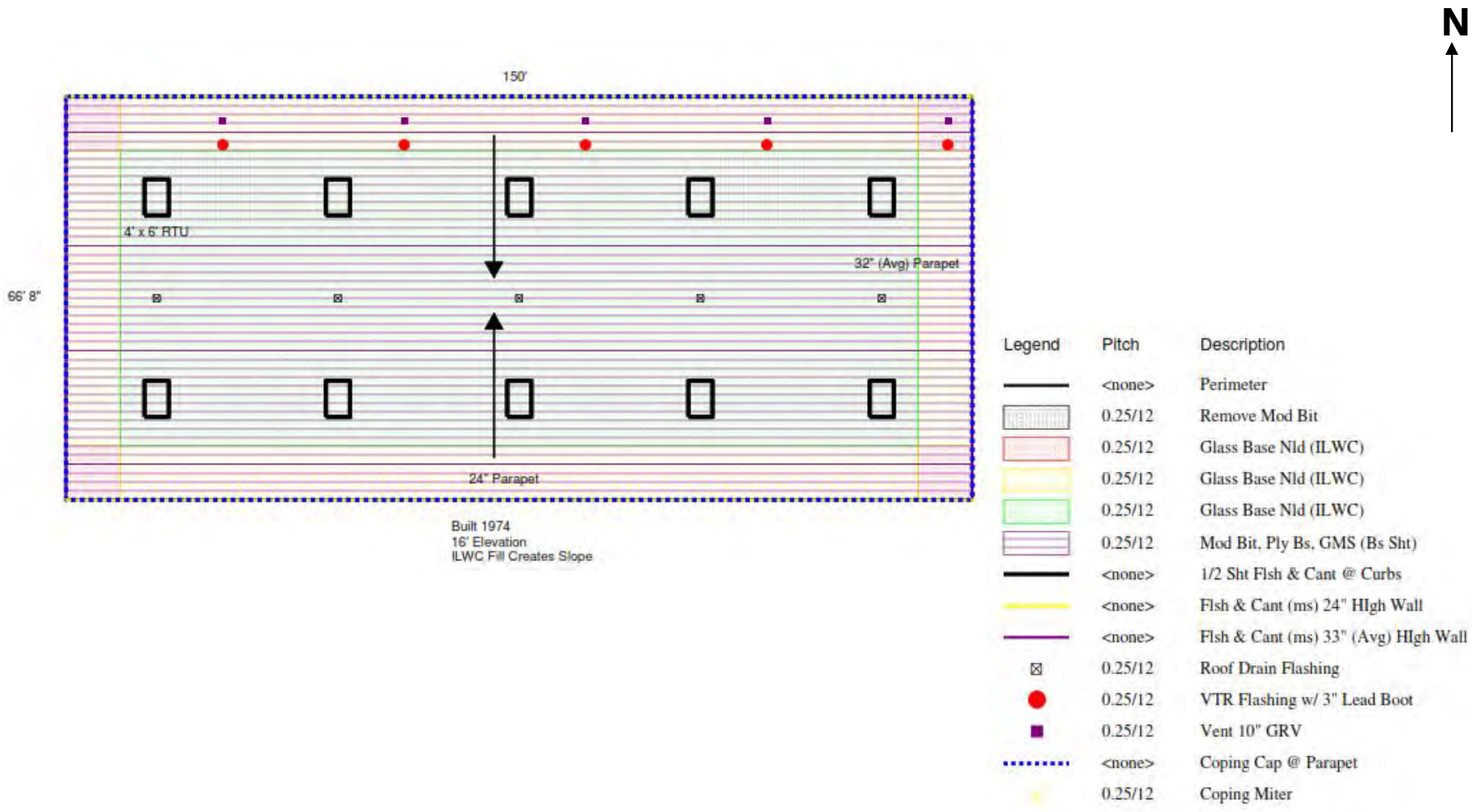
Bid Acknowledged & Submitted by:

Signature: _____

Name: _____

Firm Name: _____

Date: _____



QuEST

Quest Engineering Services & Testing, Inc.
2737 NW 19th Street
Pompano Beach, FL – 33069

Ph (954) 582 9800 **Fax (954) 582 9836**

Title:	**ROOF PLAN**	Dimensions indicated are approximate. Contractor must field verify before bidding.
Project:	**Americana Building** **123 Washington Avenue** **Anytown, FL - 30000**	
Client:	**UF College of Design, Construction & Planning**	Scale: NTS

Project No.	Drawn	Sheet No.	Revision No.	Revision Date
J-17284	**RNS**	**1 of 1**		

BASE SHEET ATTACHMENT CALCULATIONS

Project Name Americana Warehouse Building **Report No.:** J-17284.002
Project Address 123 Washington Avenue
Anytown, FL - 30000

Deck Substrate	Lightweight Concrete over Steel	Mean Roof Height	16.0 Feet
Configuration	Low Slope	Roof Area (Approx.)	10000 Sq.Ft.
Category	II	Roof Width	66.7 Feet
Exposure Condition	C	Perimeter Width	6.4 Feet
Building Type	Enclosed	Parapet Height	2.0 Feet
Base Wind Speed	170 mph	Corner Zones	6.4' x 6.4' Each

Slope V 0.0 Slope H 12.0 Slope Angle° 0.00

Uplift Pressures $q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2$ $P = q_z\ (GC_p - GC_{pi})$

q_z	K_z	K_{zt}	K_d	V	GC_p	GC_{pi}	
54.384	0.860	1.005	0.85	170	-1.00	0.18	Field
					-1.80	0.18	Perimeter
					-2.80	0.18	Corner

Field	$P_{1\ ult.}$	-64.17 psf	$P_{1\ asd}$	-38.50 psf	
Perimeter	$P_{2\ ult.}$	-107.68 psf	$P_{2\ asd}$	-64.61 psf	
Corner	$P_{3\ ult.}$	-162.06 psf	$P_{3\ asd}$	-97.24 psf	

Proposed System CertainTeed Modified Bitumen Roof System over Lightweight Concrete Decks
Product Approval No. 14-0529.01 (Page 27 of 34)
System Design Pressure -52.5 psf

Fasteners Approved OMG CR Assembled Base Sheet Fasteners

Base Sheet Width 39 inches Side Lap 4 inches Net Width 35 inches

Fastener Spacing in	Lap of Base Sheet	7 inches	# Rows	1
Fastener Spacing in	Field of Base Sheet	7 inches	# Rows	2

Min. Characteristic Resistance Force -29.77 lbf Verify with TAS-105 Tests

Fastener Spacing {(MCRF/P_i) x 144}/Row Spacing

No. of Rows of Fasteners	3	4	5	6
Field Fastener Spacing	9.54	12.73	15.91	19.09
Perimeter Fastener Spacing	5.69	7.58	9.48	11.38
Corner Fastener Spacing	3.78	5.04	6.30	7.56

RECOMMENDED BASE SHEET ATTACHMENT PATTERN

Field	1 row in the laps at 7 inches o.c.	2 rows in the center of the sheet at 7" o.c.
Perimeter	1 row in the laps at 7 inches o.c.	3 rows in the center of the sheet at 7" o.c.
Corner	1 row in the laps at 6 inches o.c.	4 rows in the center of the sheet at 6" o.c.

These calculations have been done in accordance with ASCE 7-10, based on the information provided by the contractor. The roof system must be installed in accordance with the FBC & manufacturer's recommendations. We recommend TAS-105 Tests to verify that above MCRF may be realized, before installing new roof.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

DRAINAGE EVALUATION

Project Name Americana Warehouse Building
Project Address 123 Washington Avenue
Anytown, FL - 33000

Report No.: J-17284.002

The following values are from the Florida Building Code (2010), Plumbing Code, for a 5" per hour rainfall rate

Vertical Leaders	Pipe Ø	2"	3"	4"	5"	6"	8"	
Table 1106.2(1)	Roof Area	575	1760	3680	6920	10800	23200	
Horizontal Piping	Pipe Ø		3"	4"	5"	6"	8"	10"
Table 1106.3	Roof Area		657	1504	2672	4280	9200	16580
Table 1106.7	Length	4"	6"	8"	12"	16"	20"	24"
Weirs (4" Head)	Roof Area	1794	2692	3589	5384	7179	8974	10769
Weirs (3" Head)	Roof Area	1153	1730	2307	3461	4615	5769	6923

ROOF DETAILS

Mean Roof Height 16.0 Feet
Slope V 1/8" : 12

Roof Area (Approx.) 10000 Sq.Ft.
Tributary Roofs 0 Sq.Ft.

		Length (ft)	Height (ft)
Side Walls	1	0	0
	2	0	0
	3	0	0

		Length (ft)	Height (ft)
Parapets	1	434	2
	2	0	0
	3	0	0

Effective Roof Area for Drainage purposes 10434 ft^2

PRIMARY	VERTICAL DRAINS Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1	3.50	9.62	5	11975
Type 2				
Type 3				

	THROUGH-WALL SCUPPERS (WEIRS) Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

SECONDARY	VERTICAL Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

	THROUGH-WALL SCUPPERS (WEIRS) Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1	4	12.00	4	13844
Type 2				
Type 3				

Total Primary Drain Capacity of Existing Drains 11975 ft^2 Adequate

Total Secondary Drain Capacity of Existing Scuppers 13844 ft^2 Adequate

These calculations have been done in accordance with FBC (2017), based on the information provided by the contractor. Position drainage elements such that no more than 5" of ponding occurs anywhere on roof at any time.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786)315-2590 F (786) 31525-99
www.miamidade.gov/economy

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

NOTICE OF ACCEPTANCE (NOA)

CertainTeed Corporation
18 Moores Road
Malvern, PA 19355

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: CertainTeed Modified Bitumen System over Lightweight Concrete Decks.

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA revises NOA No. 14-0224.02 and consists of pages 1 through 34.
The submitted documentation was reviewed by Alex Tigera.

ROOFING SYSTEM APPROVAL

Category: Roofing
Sub-Category: Modified Bitumen
Material: APP/SBS
Deck Type: Lightweight Concrete
Maximum Design Pressure: **-67.5 psf**

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
All Weather/Empire Base Sheet	39 3/8" x 65'10"; Roll weight: 70 lbs. (2 squares)	ASTM D 4601, Type II UL G2	Asphalt coated, fiberglass reinforced base sheet.
Flexiglas Base Sheet	39 3/8" x 98'9"; Roll weight: 90 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Modified Bitumen coated fiberglass base sheet.
Flintlastic Base 20	39 3/8" x 49'6"; Roll weight: 90 lbs. (1.5 squares)	ASTM D 6163, Grade S, Type I	Modified Bitumen coated fiberglass base sheet.
Flintlastic Ultra Glass SA	39 3/8" x 33'11"	ASTM D 6163, Type I	Self-adhering, fiberglass reinforced, SBS modified bitumen base/ply sheet.
Black Diamond Base Sheet	39 3/8" x 68'7"	ASTM D 1970	Self-adhering, fiberglass reinforced, SBS modified bitumen base/ply sheet.
Flintglas Ply Sheet Type IV	39 3/8" x 164'7"; Roll weight: 38 lbs. (5 squares)	ASTM D 2178, Type IV UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintglas Premium Ply Sheet Type VI	39 3/8" x 164'7"; Roll weight: 40 lbs. (5 squares)	ASTM D 2178, Type VI UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintlastic STA	39 3/8" x 32'10"; Roll weight: 87 lbs. (1 square)	ASTM D 6222, Grade S, Type I	Smooth surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA	39 3/8" x 32'10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA-FR	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic GMS	39 3/8" x 32'10"; Roll weight: 94 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic Premium GMS	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic FR-P	39 3/8" x 32'10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic Premium FR-P	39 3/8" x 32'10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic FR Dual Cap	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6162, Grade G, Type I	Granule surfaced SBS modified bitumen membrane with a nonwoven polyester/fiberglass composite mat reinforcement for use in cold or mop applications.
Flintlastic FR Cap 30	39 3/8" x 32'10"; Roll weight: 86 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications.
Flintlastic FR Cap 30 T	39 3/8" x 32'10"; Roll weight: 100 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for torch application.
Flintlastic Base 20 T	39 3/8" x 33'; Roll Weight: 81lbs. (1 square)	ASTM D 6163, Grade S, Type I	Modified Bitumen, coated fiberglass base sheet for torch application.
Flintlastic FR Cap 30 CoolStar	39 3/8" x 32'10"; Roll weight: 88 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic FR Cap 30 T CoolStar	39 3/8" x 32'10"; Roll weight: 102 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic GTA CoolStar	39 3/8" x 32'10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.
Flintlastic GTA-FR CoolStar	39 3/8" x 32'10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.
Flintlastic GMS CoolStar	39 3/8" x 32'10"; Roll weight: 97 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Premium GMS CoolStar	39 3/8" x 32'10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic FR-P CoolStar	39 3/8" x 32'10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Premium FR-P CoolStar	39 3/8" x 32'10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Ultra Poly SMS Base Sheet	39 3/8" x 32' 10"; Roll weight: 90 lbs. (1 square)	ASTM D 6164, Grade S, Type I	Smooth surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop applications.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Glasbase Base Sheet	39 3/8" x 98'9"; Roll weight: 75 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Asphalt coated, fiberglass base sheet.
Flintlastic Poly SMS Base Sheet	39 3/8" x 64' 3"; Roll weight: 90 lbs. (2 squares)	ASTM D 4601, Grade S, Type II UL Type G2	Modified Bitumen coated polyester base sheet.
Yosemite Venting Base Sheet	39 3/8" x 32'10"; Roll weight: 85 lbs. (1 square)	ASTM D 3909 ASTM D 4897, Type II UL G3	Mineral Surfaced fiberglass reinforced buffer sheet.
Flintlastic APP Base T	39 3/8" x 65' 4"; Roll weight: 100 lbs. (2 squares)	ASTM D6509	Modified Bitumen coated fiberglass base sheet.

APPROVED INSULATIONS:

TABLE 2

Product Name	Product Description	Manufacturer (With Current NOA)
FlintBoard ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
FlintBoard$_H$ ISO, FlintBoard$_H$ ISO Cold	Polyisocyanurate foam insulation	CertainTeed Corp.
ACFoam-II, ACFoam-IV	Polyisocyanurate foam insulation	Atlas Roofing Corp.
High Density Wood Fiberboard	Wood fiber insulation board	Generic
Perlite Insulation	Perlite insulation board	Generic
DensDeck, DensDeck Prime	Water resistant gypsum board	Georgia Pacific Gypsum LLC
H-Shield, H-Shield CG	Polyisocyanurate foam insulation	Hunter Panels LLC
ENRGY 3, ENRGY 3 25 PSI	Polyisocyanurate foam insulation	Johns Manville Corp.
Multi-Max FA-3	Polyisocyanurate roof insulation	RMax Operating, LCC
Insulfoam EPS	Expanded Polystyrene	Insulfoam, a Div. of Carlisle Const. Materials

APPROVED FASTENERS:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
1.	FM-90	Base ply fastening systems for lightweight concrete decks.	2.7" x 1.7"	Altenloh, Brinck & Co. U.S., Inc.
2.	CR Assembled Base Sheet Fastener (1.2") and CR Assembled Base Sheet Fastener (1.7")	Fastener assembly for Base Sheet fastening only	1.125" x 1.2" 2.75" Galvalume steel stress plate and 1.125" x 1.75" 2.75" Galvalume steel stress plate	OMG, Inc.
3.	Twin Loc-Nails	Galvanized stress plate and tube with integrated locking staple	2.7" round x various lengths	Altenloh, Brinck & Co. U.S., Inc.

APPROVED SURFACING/COATING OPTIONS:

TABLE 4

Chosen components must be applied according to manufacturer's application instructions. Any coating, listed below, used as a surfacing, must be listed within a current NOA.

System Number	Manufacturer	Application
1.	Generic	Gravel applied at 400 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
2.	Generic	Slag applied at 300 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
3.	Karnak Corp.	Karnak (#97 AF) Fibrated Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
4.	CertainTeed Corp.	FlintCoat A-150 applied at an application rate of 1.5 gal/sq.
5.	Gardner Asphalt Corp.	APOC #212 Fibered Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
6.	Gardner Asphalt Corp.	APOC #400 Sunbrite applied at an application rate of 3 gal./sq.

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
Factory Mutual Research Corp.	FM 4470	0D3A3.AM	04/04/97
	FM 4470	2D0A0.AM	12/23/98
	FM 4470	1D7A4.AM	11/09/98
	FM 4470	3048520	09/19/13
	FM 4470	3039046	06/15/10
Underwriters Laboratories, Inc.	UL 790	R11656	01/11/13
United States Testing Company	ASTM D 5147	97457-4	06/03/88
	ASTM D 5147	97-457-2R	12/02/87
Momentum Technologies, Inc.	ASTM D 4601	AX31G8D	09/05/08
	ASTM D6164	AX31G8F	06/05/09
	ASTM D6222	AX31G8G	06/05/09
	ASTM D 3909/ D 4897	AX31G8C	09/05/08
Trinity|ERD	TAS 114(J)	3504.06.01-1	06/05/01
	TAS 117 (B)	3503.10.06	10/10/06
	TAS 117 (B)	O6490.04.07-R1	06/27/07
	TAS 114 (H)	Letter	04/05/06
	TAS 114	3533.01.06	01/06/06
	TAS 114	3521.07.04	07/29/04
	TAS 117 (B)/ ASTM D 6862	C8500SC.11.07	11/30/07
	TAS 114	C8370.08.08	08/19/08
	ASTM Physical Properties	C10080.09.08-R4	03/25/10
	ASTM D6164/D4798	C31410.01.11-2	01/10/11
	ASTM D4601	C40050.09.12-1	09/28/12
	ASTM D1970	C40050.09.12-2	09/28/12
	ASTM D5147/D4798	C31410.10.10-R1	11/01/12
	ASTM D5147/D4798	C31410.01.11-1-R1	11/01/12
	TAS 117 B	C35500.02.11	02/09/11
	FM 4470/TAS 114	C33980.12.10	12/22/10
	TAS 117 & TAS 114	C30560.03.10	03/18/10
	TAS 117 & TAS 114	C30560.06.10	06/10/10
	FM 4470/TAS 114	C37830.07.12	07/26/12
	ASTM D1876	C35460.05.11-R1	05/20/15
	ASTM D1876, TAS 114 (H), TAS 117 (B)	C42110.08.12	08/13/12
	ASTM D1876, TAS 114 (H), FM 4474	C47320.03.14	03/26/14
	ASTM D4798	C31410.01.11-2A-R1	02/21/13
	ASTM D4798	C31410.12.13	12/05/13
	ASTM D6222	C40050.12.13-R1	12/31/13
PRI Construction Materials Technologies LLC	ASTM D6163	CTC-032-02-01	01/22/08
	ASTM D6163	CTC-066-02-01	08/09/11

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
	ASTM D6222	CTC-070-02-01	08/09/11
	ASTM D6164/D4798	CTC-093-02-01	08/09/11
	ASTM D2178	CTC-122-02-01	03/13/12
	ASTM D2178	CTC-123-02-01	03/13/12
	ASTM D4601	CTC-127-02-01	03/13/12
	ASTM D6509	CTC-116-02-01	04/04/12
	ASTM D6163	CTC-128-02-01	06/11/12
	ASTM D6163	CTC-129-02-01	06/11/12
	ASTM D6164	CTC-132-02-01	06/11/12
	ASTM D6164	CTC-162-02-01	05/09/13
	ASTM D6164	CTC-161-02-01	05/09/13
	ASTM D6162	CTC-183-02-01	10/02/13
	ASTM D6164	CTC-190-02-01	12/02/13

Membrane Type: SBS Modified

Deck Type 4: Lightweight Concrete, Non-insulated

Deck Description: Concrecel Cellular Lightweight Concrete, min 400 psi

System Type E(3): Base sheet mechanically fastened

Deck: Structural concrete or 18-22 ga ASTM A653, Grade SS80 steel deck shall be secured 6" o.c. to structural supports spaced a maximum of 5 ft on center with 5/8" puddle welds. Steel deck side laps are attached 12" o.c. with Traxx/1 fasteners. Followed by Concrecel Bonding agent applied to the deck at rate 1200 sq. ft/gal using a compressed air sprayer. Rigid insulation panels shall be placed in a minimum ¼" slurry-coat of insulating concrete and allowed to cure overnight. The following day the rigid insulation shall be covered with a minimum 2 ¼" topcoat cast of Concrecel. After an additional cure time of 24 hours, Concrecel Curing Compound was roller applied at a rate of 300-sq. ft/gal.

All General and System limitations apply.

Base Sheet: One or more plies of Glasbase Base Sheet, All Weather/Empire Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20 or Flintlastic Poly SMS Base Sheet fastened to the deck as described below:

Fastening: Fasten base sheet to the deck with OMG CR Assembled Base Sheet Fasteners spaced 7" o.c. in the 4" side lap and 7" o.c. in two evenly divided, staggered rows in the center of the sheet.

Ply Sheet: (Optional) One or more plies of All Weather/Empire Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet, Flintglas Ply Sheet Type IV or Flintglas Premium Ply Sheet Type VI adhered to the base sheet in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or one ply of Flintlastic Ultra Poly SMS Base Sheet torch applied. or one ply of Black Diamond Base Sheet or Flintlastic Ultra Glass SA self adhered.

Membrane: One or more plies of Flintlastic GMS, Flintlastic GMS CoolStar, Flintlastic Premium GMS, Flintlastic Premium GMS CoolStar, Flintlastic FR Dual Cap, Flintlastic FR-P, Flintlastic FR-P CoolStar, Flintlastic Premium FR-P, Flintlastic Premium FR-P CoolStar, Flintlastic FR Cap 30, Flintlastic FR Cap 30 CoolStar adhered to ply sheet with approved mopping asphalt applied within the EVT range and at a rate of 20 to 40 lbs./sq. or Flintlastic FR Cap 30 T or Flintlastic FR Cap 30 T CoolStar torch adhered to ply sheet.

Surfacing: (Optional) Any of the approved surfacing/coating options listed in Table 4.

Maximum Design Pressure: -52.5 psf (See General Limitation #7)

LIGHTWEIGHT INSULATING CONCRETE SYSTEM LIMITATIONS:

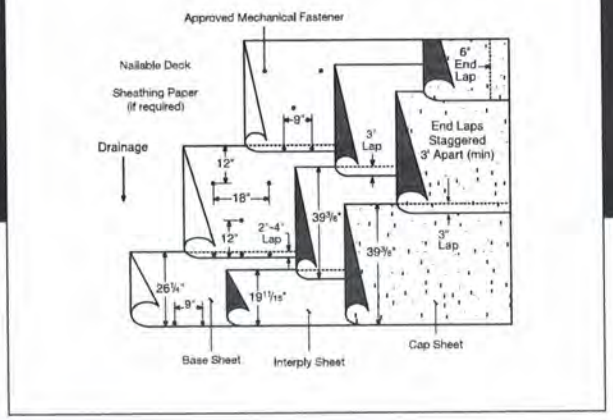
1. If mechanical attachment to the structural deck through the lightweight insulating concrete is proposed, a field withdrawal resistance testing shall be performed to determine equivalent or enhanced fastener patterns and density. All testing and fastening design shall be in compliance with Testing Application Standard TAS 105 and Roofing Application Standard RAS 117, calculations shall be signed and sealed by a Florida Registered Engineer, Architect, or Registered Roof Consultant.
2. For steel deck application where specific deck construction is not referenced: The deck shall be a minimum 22 gage attached with 5/8" puddle welds with weld washers at every flute with maximum deck spans of 5 ft. o.c.
3. For systems where specific lightweight insulating concrete is not referenced, the minimum design mix shall be a minimum of 300 psi.

GENERAL LIMITATIONS:

1. Fire classification is not part of this acceptance, refer to a current Approved Roofing Materials Directory for fire ratings of this product.
2. Insulation may be installed in multiple layers. The first layer shall be attached in compliance with Product Control Approval guidelines. All other layers shall be adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq., or mechanically attached using the fastening pattern of the top layer
3. All standard panel sizes are acceptable for mechanical attachment. When applied in approved asphalt, panel size shall be 4' x 4' maximum.
4. An overlay and/or recovery board insulation panel is required on all applications over closed cell foam insulations when the base sheet is fully mopped. If no recovery board is used the base sheet shall be applied using spot mopping with approved asphalt, 12" diameter circles, 24" o.c.; or strip mopped 8" ribbons in three rows, one at each side lap and one down the center of the sheet allowing a continuous area of ventilation. Encircling of the strips is not acceptable. A 6" break shall be placed every 12' in each ribbon to allow cross ventilation. Asphalt application of either system shall be at a minimum rate of 12 lbs./sq.
   Note: Spot attached systems shall be limited to a maximum design pressure of -45 psf.
5. Fastener spacing for insulation attachment is based on a Minimum Characteristic Force (F') value of 275 lbf., as tested in compliance with Testing Application Standard TAS 105. If the fastener value, as field-tested, are below 275 lbf. insulation attachment shall not be acceptable.
6. Fastener spacing for mechanical attachment of anchor/base sheet or membrane attachment is based on a minimum fastener resistance value in conjunction with the maximum design value listed within a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing, prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standards TAS 105 and calculations in compliance with Roofing Application Standard RAS 117.
7. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased for both insulation and base sheet as calculated in compliance with Roofing Application Standard RAS 117. Calculations prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant **(When this limitation is specifically referred within this NOA, General Limitation #9 will not be applicable.)**
8. All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform to Roofing Application Standard RAS 111 and applicable wind load requirements.
9. The maximum designed pressure limitation listed shall be applicable to all roof pressure zones (i.e. field, perimeters, and corners). Neither rational analysis, nor extrapolation shall be permitted for enhanced fastening at enhanced pressure zones (i.e. perimeters, extended corners and corners). **(When this limitation is specifically referred within this NOA, General Limitation #7 will not be applicable.)**
10. All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

END OF THIS ACCEPTANCE

SBS-N-3-A



Base sheet, one interply sheet and an SBS modified cap sheet

SUBSTRATE:
- Nailable (mechanically attached, Sec. 3.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
Approved base sheet, mechanically attached to approved substrate (Sec. 15.0).

Approved interply sheet set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- Base sheet (1 ply)
- Interply sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if interply is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED INTERPLY SHEETS:
(one of the following)
- All Weather/ Empire Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas Base Sheet
- Flintlastic Base 20
- Flintglas® Ply 4
- Flintglas Premium Ply 6
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

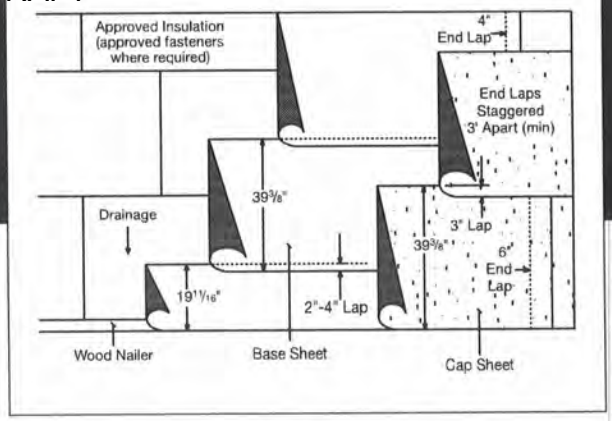
WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed SAINT-GOBAIN
Commercial Roofing

SBS-I-2-A



Insulated substrates: base sheet and an SBS modified cap sheet

SUBSTRATE:
- Steel and nailable (mechanically attached, Sec. 15.4)
- Non-nailable (adhered, Sec. 4.0)
- Insulation (Sec. 4.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
One or more layers of approved insulation and/or coverboard:
- Base layer mechanically attached and additional layers mechanically attached or adhered in hot asphalt or approved adhesive.
- Base layer and additional layers adhered in hot asphalt or approved adhesive.
- Vapor retarder/anchor sheets (Sec. 4.7).

Approved base sheet, set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- One or more layers of insulation and/ or coverboard
- Base sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if base sheet is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed
SAINT-GOBAIN
Commercial Roofing

APPENDIX B

MODIFIED BITUMEN SBS ROOF OVER WOOD DECK SYSTEM PROTOCOL

BID PACKAGE

for

RE-ROOF INSTALLATION (Wood)

at

AMERICANA WAREHOUSE BUILDING
123 WASHINGTON AVENUE
ANYTOWN, FL - 33000

Prepared for

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

May 8, 2018

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INTRODUCTION

The subject property comprises of a warehouse building that was built in 1974. This 1-story warehouse building has a flat roof with a wood deck. The main flat roof is at an elevation of about 16 feet. The total roof area is approximately 10,000 sf. The main roof has a Modified Bitumen roof system over the wood deck. This specification addresses the removal of the existing roof down to the wood deck and the installation of a new CertainTeed Modified Bitumen roof system.

Quest Engineering Services & Testing, Inc. (QuEST) has prepared the following bid package for the new roof installation at the subject site. The new roof proposed is a CertainTeed Modified Bitumen SBS Roof System over Wood Decks. This roof system's Miami-Dade Notice of Acceptance No. is 17-1003.04 (Page 24 of 42, System Design Pressure -52.5 psf with Limitation #7). This system comprises of a mechanically attached Flexiglas Base Sheet, hot-mopped Flintlastic Poly SMS ply sheet and a hot-mopped Flintlastic GMS Cap Sheet.

SCOPE OF PROJECT

The scope of this project is to remove the existing roof down to the wood deck, inspect, verify that it is 5/8" thick (replace sheathing, if necessary), re-nail the existing roof deck and then install the new roof system in accordance with the Florida Building Code (2017). Prior to commencement of the re-roofing contractor shall verify existing wood deck condition and truss anchoring. Damaged deck areas will need to be replaced and entire deck sheathing renailed. As a part of the new roof installation, the membrane should be draped up and over the parapet walls and a new coping cap installed. The owner reserves the right to request post-installation bell chamber tests (TAS-124) to assure that roof system has been installed in an acceptable manner. Failing areas will need to be repaired and retested at contractor's expense, before acceptance.

As this project's aim is to generate a reliable bid as it pertains to deck diaphragm improvements required by the new Florida Building Code (2017) associated with re-roofing on old buildings that were designed with wind codes pre-dating ASCE 7-88, we have eliminated work associated with RTUs and/or its upgrades. The contractor must install CertainTeed and FBC approved flashing around all roof penetrations and equipment curbs.

For purposes of this research project, the wood deck is assumed to be sloped adequately to achieve positive drainage. As indicated in the attached drainage evaluation, the existing primary drains and emergency overflow scuppers are adequate. Ensure that these scuppers are positioned such that their bottoms are not less than 2" or more than 4" above roof level. Care should be taken to ensure that ponding water in excess of 5" does not occur at any time at any portion of the roof.

The information provided in these specifications is for general informational purposes only. The contractor is responsible for obtaining a re-roofing permit and coordinating with the Building Department for all necessary in-progress and final inspections. All testing and engineering necessary to obtain a permit and complete this job are the also the contractor's responsibility.

The roof contractor must be certified by CertainTeed Corp to install this roof system. The contractor must provide a 20-year NDL warranty on labor and materials. All work should be done in accordance with the Florida Building Code (2017), including applicable HVHZ protocols. All installation, product and safety guidelines of the roof system manufacturer, along with OSHA mandated safety guidelines should be followed. In case of conflicts, the more stringent standard should be followed.

Safety and Clean-Up

The contractor, its employees, representatives, agents and sub-contractors should observe all safety precautions as required by OSHA during the entire duration of this project. The contractor should also clean-up on a daily basis. This is an occupied facility and contractor must maintain the site in a presentable fashion at all times.

Insurance Requirements

The roofing contractor must maintain all necessary licenses and insurance certificates throughout the duration of the job.

Mail Sealed Bids:

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

Ph (352) 222 6147 Fax (561) 245 4447

Deadline: Bid Packages must be received by **5:00 PM on May 15, 2018.**

All technical questions concerning this bid package may be addressed directly to Quest Engineering Services & Testing, Inc. If there are any technical questions, please contact:

R. N. Sailappan, P.E., *Quest Engineering Services & Testing, Inc.*, **Ph (954) 582 9800**

REROOFING SPECIFICATIONS

This section outlines the general guidelines for the bidding and reproofing at the subject site. The guidelines under the general sub-section apply to the entire project.

General

1. Only those bidders on the invited bidders list are eligible to bid on this project.

2. All bidders must be licensed in the State of Florida and have a minimum of 5 years of experience providing such services.

3. The bid should also identify the bidder's contact person and contact information.

4. All bidders should maintain appropriate licenses and insurance requirements during the entire project duration. The liability insurance policy should name AMPCO as additional insured. The minimum insurance requirements are as follow:

Workman's Compensation	-	Statutory Limits
General Liability & Property Damage	-	$1,000,000.00

5. The bid packages should include the following:

   a) Bidder's Contact Information
   b) Filled out Bid Form with Cost Proposal for Roof Replacement with breakdowns for all 3 facets, namely:

      Sheathing Re-nailing to satisfy new diaphragm shear enhancements
      Enhance Edge Connections to satisfy new diaphragm shear enhancements
      Sheathing Replacement to satisfy new diaphragm shear enhancements

REQUIRED SUBMITTALS BY SELECTED CONTRACTOR

A. Prior to starting work, the roofing contractor must submit the following:

1. Shop drawings showing layout, details of construction and identification of materials.

2. A sample of the manufacturer's Membrane System Warranty.

3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.

4. Certification of the manufacturer's warranty reserve.

B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

BID FORM

Contractor:

Date till which Price is Valid:

Cost Proposal:

1. Base Bid for Roof Replacement $ _____
2. Fee for Investigating Truss Anchoring $ _____
   Cut and expose Drywall/drop-down ceiling along roof perimeter to verify Truss anchoring
3. Additional Cost for Enhanced Anchoring $ _____
   434 linear feet of perimeter; 304 Truss Bearing Points
   Install 1-5/8" x 16 ga. Simpson hurricane straps at each truss bearing secured to tie beam/filled cell in masonry wall with five Ø ¼" tapcons (minimum 2" embedment concrete) and to each truss with five 10d nails
4. Additional Cost for Truss bracing (if required) $ _____
5. Unit Cost for Deck Sheathing Replacement $ _____
   Removal of damaged wood deck and its disposal
   Replacement deck to be 5/8" plywood sheathing (trusses at 2' o.c.)
   Sheathing to be secured to trusses with 8d nails at 6" o.c.
6. Added Cost for Full Sheathing Replacement $ _____
   Removal of damaged wood deck and its disposal
   Replacement deck to be 5/8" plywood sheathing (trusses at 2' o.c.)
   Sheathing to be secured to trusses with 8d nails at 6" o.c.
7. Associated Engineering Cost $ _____

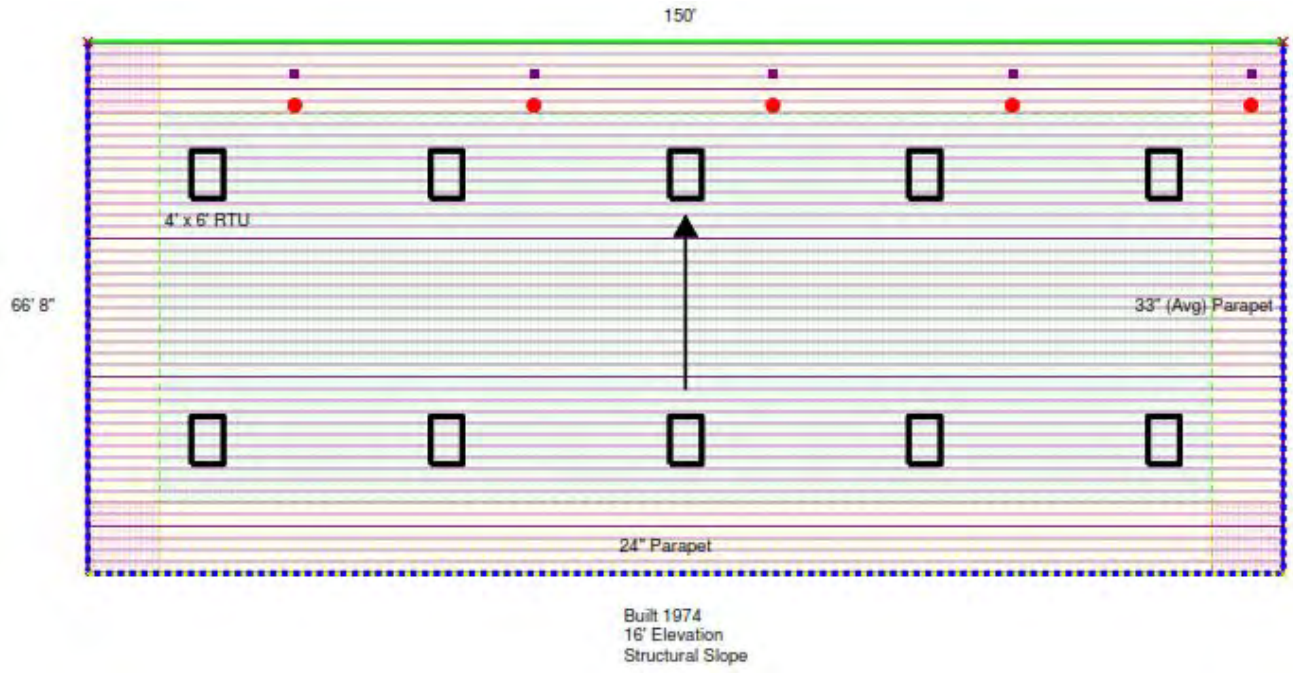
All work will be done by licensed personnel after obtaining relevant permits, in accordance with the Florida Building Code (2017). Bid acknowledged and submitted by:

Signature: _____

Name: _____

Firm Name: _____

Date: _____



N

Legend	Pitch	Description
	<none>	Perimeter
	0.25/12	Remove Mod Bit
	0.25/12	Inspect & Renail Sheathing as Needed
	0.25/12	Gls Bs & Rsn Nld (Wood)
	0.25/12	Gls Bs & Rsn Nld (Wood)
	0.25/12	Gls Bs & Rsn Nld (Wood)
	0.25/12	Mod Bit, Ply Bs, GMS (Bs Sht)
	<none>	1/2 Sht Flsh & Cant @ Curbs
	<none>	Flsh & Cant (ms) 24" HIgh Wall
	<none>	Flsh & Cant (ms) 33" (Avg) HIgh Wall
	0.25/12	VTR Flashing w/ 3" Lead Boot
	0.25/12	Vent 10" GRV
	0.25/12	End of Flsh Closure & Trim
	0.25/12	Metal Edge over Existing Gutter
	<none>	Coping Cap @ Parapet
	0.25/12	Coping End
	0.25/12	Coping Miter

QuEST

Quest Engineering Services & Testing, Inc.
2737 NW 19th Street
Pompano Beach, FL – 33069

Ph (954) 582 9800 **Fax (954) 582 9836**

Title:	**ROOF PLAN**
Project:	**Americana Building** **123 Washington Avenue** **Anytown, FL - 30000**
Client:	**UF College of Design, Construction & Planning**

Dimensions indicated are approximate. Contractor must field verify before bidding.

Scale: NTS

Project No.	Drawn	Sheet No.	Revision No.	Revision Date
J-17284	**RNS**	**1 of 1**		

BASE SHEET ATTACHMENT CALCULATIONS

Project Name Americana Warehouse Building **Report No.:** J-17284.003
Project Address 123 Washington Avenue
Anytown, FL - 30000

Deck Substrate	Wood	Non-Insulated	Mean Roof Height	16.0	Feet
Configuration	Low Slope		Roof Area (Approx.)	10000	Sq.Ft.
Category	II		Roof Width	66.7	Feet
Exposure Condition	C		Perimeter Width	6.4	Feet
Building Type	Enclosed		Parapet Height	2.0	Feet
Base Wind Speed	170	mph	Corner Zones	6.4' x 6.4'	Each

Slope V 0.0 Slope H 12.0 Slope Angle° 0.00

Uplift Pressures $q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2$ $P = q_z\ (GC_p - GC_{pi})$

q_z	K_z	K_{zt}	K_d	V	GC_p	GC_{pi}	
54.384	0.860	1.005	0.85	170	-1.00	0.18	Field
					-1.80	0.18	Perimeter
					-2.80	0.18	Corner

Field	$P_{1\ ult.}$	-64.17 psf	$P_{1\ asd}$	-38.50 psf	
Perimeter	$P_{2\ ult.}$	-107.68 psf	$P_{2\ asd}$	-64.61 psf	
Corner	$P_{3\ ult.}$	-162.06 psf	$P_{3\ asd}$	-97.24 psf	

Proposed System CertainTeed Modified Bitumen Roof System over Wood Decks
Product Approval No. 17-1003.04 (Page 24 of 42)
System Design Pressure -52.5 psf

Fasteners 11 ga. Annular Ring Shank Nails and Approved Tin Caps

Base Sheet Width 39 inches Side Lap 4 inches Net Width 35 inches

Fastener Spacing in Lap of Base Sheet 8 inches # Rows 1
Fastener Spacing in Field of Base Sheet 8 inches # Rows 3

Min. Characteristic Resistance Force -25.52 lbf

Fastener Spacing {(MCRF/P_i) x 144}/Row Spacing

No. of Rows of Fasteners	4	5	6	7
Field Fastener Spacing	10.91	13.63	16.36	19.09
Perimeter Fastener Spacing	6.50	8.13	9.75	11.38
Corner Fastener Spacing	4.32	5.40	6.48	7.56

RECOMMENDED BASE SHEET ATTACHMENT PATTERN

Field	1 row in the laps at 8 inches o.c.	3 rows in the center of the sheet at 8" o.c.
Perimeter	1 row in the laps at 8 inches o.c.	4 rows in the center of the sheet at 8" o.c.
Corner	1 row in the laps at 5 inches o.c.	4 rows in the center of the sheet at 5" o.c.

These calculations have been done in accordance with ASCE 7-10, based on the information provided by the contractor. The roof system must be installed in accordance with the FBC & manufacturer's recommendations.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

Quest Engineering Services & Testing, Inc. (CA # 7954), 2737 NW 19 St., Pompano Beach, FL-33069 Ph (954) 582 9800 Fax (954) 582 9836

DRAINAGE EVALUATION

Project Name Americana Warehouse Building
Project Address 123 Washington Avenue
Anytown, FL - 33000

Report No.: J-17284.003

The following values are from the Florida Building Code (2010), Plumbing Code, for a 5" per hour rainfall rate

Vertical Leaders	Pipe Ø	2"	3"	4"	5"	6"	8"	
Table 1106.2(1)	Roof Area	575	1760	3680	6920	10800	23200	
Horizontal Piping	Pipe Ø		3"	4"	5"	6"	8"	10"
Table 1106.3	Roof Area		657	1504	2672	4280	9200	16580
Table 1106.7	Length	4"	6"	8"	12"	16"	20"	24"
Weirs (4" Head)	Roof Area	1794	2692	3589	5384	7179	8974	10769
Weirs (3" Head)	Roof Area	1153	1730	2307	3461	4615	5769	6923

ROOF DETAILS

Mean Roof Height 16.0 Feet
Slope V 1/8" : 12

Roof Area (Approx.) 10000 Sq.Ft.
Tributary Roofs 0 Sq.Ft.

		Length (ft)	Height (ft)
Side Walls	1	0	0
	2	0	0
	3	0	0

		Length (ft)	Height (ft)
Parapets	1	434	2
	2	0	0
	3	0	0

Effective Roof Area for Drainage purposes 10434 ft^2

PRIMARY	VERTICAL DRAINS Size Ø	Area	# Drains	Drainage Cap. (ft^2)	THROUGH-WALL SCUPPERS (WEIRS) Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1	3.50	9.62	5	11975	Type 1			
Type 2					Type 2			
Type 3					Type 3			

SECONDARY	VERTICAL Size Ø	Area	# Drains	Drainage Cap. (ft^2)	THROUGH-WALL SCUPPERS (WEIRS) Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1					Type 1	4	12.00	4	13844
Type 2					Type 2				
Type 3					Type 3				

Total Primary Drain Capacity of Existing Drains 11975 ft^2 Adequate

Total Secondary Drain Capacity of Existing Scuppers 13844 ft^2 Adequate

These calculations have been done in accordance with FBC (2017), based on the information provided by the contractor. Position drainage elements such that no more than 5" of ponding occurs anywhere on roof at any time.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786)315-2590 F (786) 31525-99
www.miamidade.gov/economy

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

NOTICE OF ACCEPTANCE (NOA)

CertainTeed Corporation
20 Moores Road
Malvern, PA 19355

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: CertainTeed Modified Bitumen Roofing Systems over Wood Decks.

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA renews NOA #14-0529.02 and consists of pages 1 through 42.
The submitted documentation was reviewed by Alex Tigera.

MIAMI-DADE COUNTY APPROVED

NOA No.: 17-1003.04
Expiration Date: 06/19/23
Approval Date: 04/19/18
Page 1 of 42

ROOFING SYSTEM APPROVAL

Category: Roofing
Sub-Category: Modified Bitumen
Material: APP/SBS
Deck Type: Wood
Maximum Design Pressure: **-127.5 psf.**

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
All Weather/Empire Base Sheet	39 3/8" x 65'10"; Roll weight: 70 lbs. (2 squares)	ASTM D 4601, Type II UL Type G2	Asphalt coated, fiberglass reinforced base sheet.
Flexiglas Base Sheet	39 3/8" x 98'9"; Roll weight: 90 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Modified Bitumen coated fiberglass base sheet.
Flintlastic Base 20	39 3/8" x 49' 6"; Roll weight: 90 lbs. (1.5 squares)	ASTM D 6163, Grade S, Type I	Modified Bitumen coated fiberglass base sheet.
Flintglas Ply Sheet Type IV	39 3/8" x 164'7"; Roll weight: 38 lbs. (5 squares)	ASTM D 2178, Type IV UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintglas Premium Ply Sheet Type VI	39 3/8" x 164'7"; Roll weight: 40 lbs. (5 squares)	ASTM D 2178, Type VI UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintlastic STA	39 3/8" x 32' 10"; Roll weight: 87 lbs. (1 square)	ASTM D 6222, Grade S, Type I	Smooth surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA-FR	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GMS	39 3/8" x 32' 10"; Roll weight: 94 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic Premium FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic FR Dual Cap	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6162, Grade G, Type I	Granule surfaced SBS modified bitumen membrane with a nonwoven polyester/fiberglass composite mat reinforcement for use in cold or mop applications.
Flintlastic FR Cap 30	39 3/8" x 32' 10"; Roll weight: 86 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications.
Flintlastic FR Cap 30 T	39-3/8" x 32' 10"; Roll weight: 100 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for torch application.
Flintlastic Base 20 T	39-3/8" x 33'; Roll Weight: 81 lbs. (1 square)	ASTM D 6163, Grade S, Type I	Modified Bitumen, coated fiberglass base sheet for torch application.
Flintlastic FR Cap 30 CoolStar	39 3/8" x 32' 10"; Roll weight: 88 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic FR Cap 30 T CoolStar	39 3/8" x 32' 10"; Roll weight: 102 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic GTA CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic GTA-FR CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.
Flintlastic GMS CoolStar	39 3/8" x 32' 10"; Roll weight: 97 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Premium FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Ultra Poly SMS Base Sheet	39 3/8" x 32' 10"; Roll weight: 90 lbs. (1 squares)	ASTM D 6164, Grade S, Type I	Smooth surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop applications.
Glasbase Base Sheet	36" x 98' 9"; Roll weight: 75 lbs. (3 squares)	ASTM D 4601, Type II, UL Type G2	Asphalt coated, fiberglass base sheet.
Flintlastic Poly SMS Base Sheet	39 3/8" x 64' 3"; Roll weight: 90 lbs. (2 squares)	ASTM D 4601, Grade S, Type II UL Type G2	Modified Bitumen coated polyester base sheet.
Yosemite Venting Base Sheet	39 3/8" x 32'10"; Roll weight: 85 lbs. (1 square)	ASTM D 3909 ASTM D 4897, Type II UL Type G3	Mineral Surfaced fiberglass reinforced buffer sheet.
Flintlastic APP Base T	39 3/8" x 65' 4"; Roll weight: 100 lbs. (2 squares)	ASTM D 6509	Modified Bitumen coated fiberglass base sheet.

Flintlastic Ultra Glass SA	39 3/8" x 33'11"; Roll weight: 73 lbs. (1 square)	ASTM D 1970	Self-adhering, fiberglass reinforced, SBS modified bitumen base/ply sheet.
Black Diamond™ Base Sheet	36" x 68'7"; Roll weight: 78 lbs. (2 squares)	ASTM D 1970	Self-adhering fiberglass reinforced modified bitumen base sheet

APPROVED INSULATIONS:

TABLE 2

Product Name	Product Description	Manufacturer (With Current NOA)
FlintBoard ISO	Polyisocyanurate foam insulation	CertainTeed Corporation
FlintBoard$_H$ ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
ACFoam -II	Polyisocyanurate foam insulation	Atlas Roofing Corp.
DensDeck	Water resistant gypsum board	Georgia Pacific Gypsum LLC
DensDeck Prime	Water resistant gypsum board	Georgia Pacific Gypsum LLC
H-Shield	Polyisocyanurate foam insulation	Hunter Panels LLC
ENRGY 3	Polyisocyanurate foam insulation	Johns Manville Corp.
ENRGY 3 25 PSI	Polyisocyanurate foam insulation	Johns Manville Corp.
Multi-Max FA-3 SECUROCK Gypsum-Fiber Roof Board	Polyisocyanurate foam insulation homogenous fiber reinforced	RMax Operating, LLC USG Corp.
Structodek High Density Fiberboard Roof Insulation	High Density Wood Fiber Insulation board	Blue Ridge Fiberboard, Inc.
FescoBoard	Expanded perlite and fiber insulation	Johns Manville Corp.

APPROVED FASTENERS:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
1.	Trufast #12 DP Fastener	Insulation fastener for wood and steel decks	various	Altenloh, Brinch & Co. U.S., Inc.
2.	Trufast 3" Metal Insulation Plate	Galvalume steel plate	3" round	Altenloh, Brinch & Co. U.S., Inc.
3.	FlintFast #12	Coated, carbon steel screw	various	CertainTeed Corp.
4.	FlintFast 3" Insulation Plate	Galvalume AZ50 steel plate	3" round	CertainTeed Corp.
5.	FlintFast #14	Insulation fastener for wood and steel decks	various	CertainTeed Corp.
6.	Simplex MAXX Cap	Polymer fastner	1" long	Simplex Nails, Inc.
7.	OMG #12 Standard Roofgrip	Insulation fastener for wood and steel.	various	OMG, Inc.
8.	OMG 3" Galvalume Steel Plate	Galvalume stress plate	3" round	OMG, Inc.
9.	Trufast #14 HD Fastener	Insulation fastener for wood and steel decks	various	Altenloh, Brinch & Co. U.S., Inc.
10.	OMG Heavy Duty	Insulation and membrane fastener	Various	OMG, Inc.
11.	3 in. Round Metal Plate	Galvalume AZ50 steel plate	3" round	OMG, Inc.
12.	AccutTrac Hextra	Carbon steel fastener	Various	OMG, Inc.
13.	AccuTrac Plate	Galvalume stress plate.	3" square	OMG, Inc.
14.	AccuTrac Flat Bottom Plate	A2-SS aluminized steel plate	3" square	OMG, Inc.
15.	Millennium One Step Foamable Adhesive	Polyurethane two component high rise insulation adhesive	1.5 liters	Adco Products, Inc. d.b.a. Royal Adhesives & Sealants, Inc.
16.	Millennium PG-1 Low Viscosity Insulation Adhesive	Polyurethane two component low rise insulation adhesive	1.5 liters	Adco Products, Inc. d.b.a. Royal Adhesives & Sealants, Inc.
17.	Insta Stik Quik Set Insulation	Polyurethane one component moisture curing adhesive	It is supplied in pressurized cylinders with a net weight of 23 lbs., with a total unit weight of 30 lbs.	The Dow Chemical Company

APPROVED FASTENERS:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
18.	OMG OlyBond 500 Adhesive	Spray polyurethane foam insulation adhesive	10 gal. bag-in-box set and 1.5 liters SpotShot cartridge	OMG, Inc.
19.	OMG OlyBond 500 Green Adhesive	Spray polyurethane foam insulation adhesive	10 gal. bag-in-box set and 1.5 liters SpotShot cartridge	OMG, Inc.

APPROVED SURFACING/COATING OPTIONS:

TABLE 4

Chosen components must be applied according to manufacturer's application instructions. Any coating, listed below, used as a surfacing, must be listed within a current NOA.

System Number	Manufacturer	Application
1.	Generic	Gravel applied at 400 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
2.	Generic	Slag applied at 300 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
3.	Karnak Corp.	Karnak (#97 AF) Fibrated Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
4.	CertainTeed Corp.	FlintCoat A-150 applied at an application rate of 1.5 gal/sq.
5.	Gardner Asphalt Corp.	APOC #212 Fibered Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
6.	Gardner Asphalt Corp.	APOC #400 Sunbrite applied at an application rate of 3 gal./sq.

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
Factory Mutual Research Corp.	FM 4470	3Y8A1.AM	03/23/96
	FM 4470	0D3A3.AM	04/04/97
	FM 4470	2D0A0.AM	12/23/98
	FM 4470	1D7A4.AM	11/09/98
	FM 4470	3039046	06/15/10
	FM 4470	3048520	09/19/13
Underwriters Laboratories, Inc.	UL 790	R11656	01/11/13
United States Testing Company	ASTM D 5147	97457-4	06/03/88
	ASTM D 5147	97-457-2R	12/02/87
Momentum Technologies, Inc.	ASTM D6164	AX31G8F	06/05/09
Trinity|ERD	TAS 114(J)	3507.08.99-1	04/18/01
	TAS 114(J)	3504.06.01-1	06/05/01
	TAS 114	3521.07.04	07/29/04
	TAS 114	3533.01.06	01/06/06
	TAS 114 (H)	Letter	04/05/06
	TAS 117 (B)	3503.10.06	10/10/06
	TAS 117 (B)	O6490.04.07-R1	06/27/07
	TAS 117 (B)/ ASTM D 6862	C8500SC.11.07	11/30/07
	TAS 114	C8370.08.08	08/19/08
	FM 4470, TAS 114, FM 4470, TAS 114(J)	C8370.08.08-R1	10/05/09
	ASTM Physical Properties	C10080.09.08-R4	03/25/10
	TAS 114(H), TAS 117(B), TAS 114(J)	C30560.06.10	6/10/10
	FM 4470, TAS 114	C32830.07.10	7/20/10
	ASTM D6164/D4798	C31410.01.11-2	01/10/11
	TAS 117B	C35500.02.11	02/09/11
	ASTM D4601	C40050.09.12-1	09/28/12
	ASTM D1876	C35460.05.11	06/16/11
	ASTM D1876, TAS 114 (H), TAS 117 (B)	C42110.08.12	08/13/12
	FM 4474/TAS 114	C39670.08.12	08/20/12
	ASTM D1970	C40050.09.12-2	09/28/12
	ASTM D5147/D4798	C31410.10.10-R1	11/01/12
	ASTM D5147/D4798	C31410.01.11-1-R1	11/01/12
	ASTM D4798	C31410.01.11-2A-R1	02/21/13
	ASTM D4798	C31410.12.13	12/05/13
	ASTM D6222	C40050.12.13-R1	12/31/13
	TAS 117, TAS 114	C30310.12.09-R1	03/07/14
	ASTM D1876, TAS 114 (H), FM 4474	C45620.03.14	03/27/14
	ASTM D1876, TAS 114 (H), FM 4474	C47320.03.14-R1	04/01/15

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
	ASTM D4601-04 (2012), Type II	CTR-SC11145.09.16-3A	09/19/16
PRI Construction Materials Technologies LLC	ASTM D6163	CTC-066-02-01	08/09/11
	ASTM D6222	CTC-071-02-01	08/08/11
	ASTM D6222	CTC-070-02-01	08/09/11
	ASTM D6164/D4798	CTC-093-02-01	08/09/11
	ASTM D4601	CTC-126-02-01	03/12/12
	ASTM D2178	CTC-122-02-01	03/13/12
	ASTM D2178	CTC-123-02-01	03/13/12
	ASTM D4601	CTC-127-02-01	03/13/12
	ASTM D6163	CTC-128-02-01	06/11/12
	ASTM D6163	CTC-129-02-01	06/11/12
	ASTM D6164	CTC-132-02-01	06/11/12
	ASTM D6164	CTC-161-02-01	05/09/13
	ASTM D6162	CTC-183-02-01	10/02/13
	ASTM D6164	CTC-190-02-01	12/02/13
	ASTM D1970	CTC-199-02-01	01/22/14
	ASTM D6163	CTC 319-02-01	08/22/17

Membrane Type: SBS Modified

Deck Type 1: Wood, Non-Insulated

Deck Description: $^{19}/_{32}$" or greater plywood or wood plank attached with 8d ring shank nails spaced 6" o.c. at wood joists spaced maximum 24" o.c.

System Type E(4): Base sheet mechanically fastened.

All General and System Limitations apply.

Base Sheet: One ply of All Weather/Empire Base Sheet, Yosemite Venting Base Sheet, Flexiglas Base Sheet, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet, Glasbase Base Sheet or Flintglas Premium Ply Sheet Type VI mechanically attached as detailed below.

Fastening: Base sheet shall be lapped 4" and fastened with 11 ga. annular ring shank nails and approved tin caps 8"o.c. in the lap and three rows staggered in the center of the sheet 8"o.c.

Ply Sheet: (Optional) One ply of All Weather/Empire Base Sheet, Flintlastic Ultra Poly SMS Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet or one or more plies of Flintglas Ply Sheet Type IV or Flintglas Premium Ply Sheet Type VI adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or one ply of Black Diamond Base Sheet or Flintlastic Ultra Glass SA self-adhered or Flintlastic Ultra Poly SMS Base Sheet torch adhered.

Membrane: One ply of Flintlastic GMS, Flintlastic GMS CoolStar, Flintlastic FR Dual Cap, Flintlastic FR-P, Flintlastic FR-P CoolStar, Flintlastic Premium FR-P, Flintlastic Premium FR-P CoolStar, Flintlastic FR Cap 30, Flintlastic FR Cap 30 CoolStar adhered to ply sheet with approved mopping asphalt applied within the EVT range and at a rate of 20 to 40 lbs./sq. or Flintlastic FR Cap 30 T or Flintlastic FR Cap 30 T CoolStar torch adhered to ply sheet.

Surfacing: (Optional) Any of the approved surfacing/coating options listed in Table 4.

Maximum Design Pressure: -52.5 psf. (See General Limitation #7)

WOOD DECK SYSTEM LIMITATIONS:

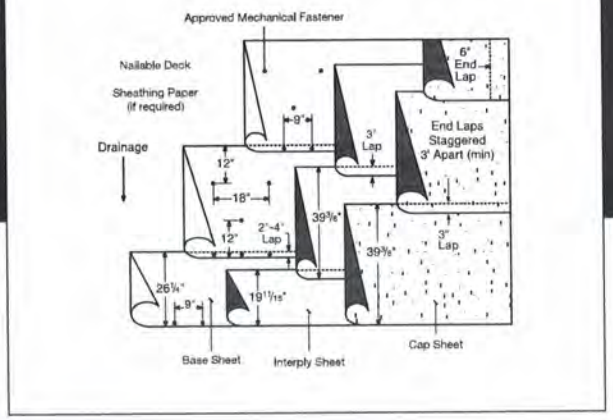
1. A slip sheet is required with Ply 4 and Ply 6 when used as a mechanically fastened base or anchor sheet.

GENERAL LIMITATIONS:

1. Fire classification is not part of this acceptance; refer to a current Approved Roofing Materials Directory for fire ratings of this product.
2. Insulation may be installed in multiple layers. The first layer shall be attached in compliance with Product Control Approval guidelines. All other layers shall be adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq., or mechanically attached using the fastening pattern of the top layer
3. All standard panel sizes are acceptable for mechanical attachment. When applied in approved asphalt, panel size shall be 4' x 4' maximum.
4. An overlay and/or recovery board insulation panel is required on all applications over closed cell foam insulations when the base sheet is fully mopped. If no recovery board is used the base sheet shall be applied using spot mopping with approved asphalt, 12" diameter circles, 24" o.c.; or strip mopped 8" ribbons in three rows, one at each side lap and one down the center of the sheet allowing a continuous area of ventilation. Encircling of the strips is not acceptable. A 6" break shall be placed every 12' in each ribbon to allow cross ventilation. Asphalt application of either system shall be at a minimum rate of 12 lbs./sq.
   Note: Spot attached systems shall be limited to a maximum design pressure of -45 psf.
5. Fastener spacing for insulation attachment is based on a Minimum Characteristic Force (F') value of 275 lbf., as tested in compliance with Testing Application Standard TAS 105. If the fastener value, as field-tested, are below 275 lbf. insulation attachment shall not be acceptable.
6. Fastener spacing for mechanical attachment of anchor/base sheet or membrane attachment is based on a minimum fastener resistance value in conjunction with the maximum design value listed within a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing, prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standards TAS 105 and calculations in compliance with Roofing Application Standard RAS 117.
7. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased for both insulation and base sheet as calculated in compliance with Roofing Application Standard RAS 117. Calculations prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant **(When this limitation is specifically referred within this NOA, General Limitation #9 will not be applicable.)**
8. All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform to Roofing Application Standard RAS 111 and applicable wind load requirements.
9. The maximum designed pressure limitation listed shall be applicable to all roof pressure zones (i.e. field, perimeters, and corners). Neither rational analysis, nor extrapolation shall be permitted for enhanced fastening at enhanced pressure zones (i.e. perimeters, extended corners and corners). **(When this limitation is specifically referred within this NOA, General Limitation #7 will not be applicable.)**
10. All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

END OF THIS ACCEPTANCE

SBS-N-3-A



Base sheet, one interply sheet and an SBS modified cap sheet

SUBSTRATE:
- Nailable (mechanically attached, Sec. 3.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
Approved base sheet, mechanically attached to approved substrate (Sec. 15.0).

Approved interply sheet set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- Base sheet (1 ply)
- Interply sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if interply is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED INTERPLY SHEETS:
(one of the following)
- All Weather/ Empire Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas Base Sheet
- Flintlastic Base 20
- Flintglas® Ply 4
- Flintglas Premium Ply 6
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

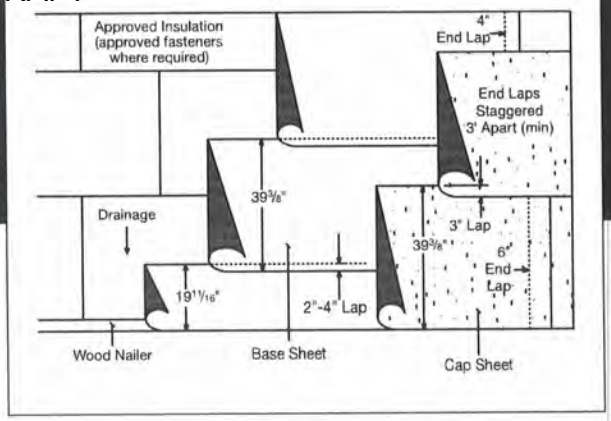
Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed SAINT-GOBAIN
Commercial Roofing

SBS-I-2-A

Insulated substrates: base sheet and an SBS modified cap sheet



SUBSTRATE:

- Steel and nailable (mechanically attached, Sec. 15.4)
- Non-nailable (adhered, Sec. 4.0)
- Insulation (Sec. 4.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:

Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:

One or more layers of approved insulation and/or coverboard:

- Base layer mechanically attached and additional layers mechanically attached or adhered in hot asphalt or approved adhesive.
- Base layer and additional layers adhered in hot asphalt or approved adhesive.
- Vapor retarder/anchor sheets (Sec. 4.7).

Approved base sheet, set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:

- One or more layers of insulation and/ or coverboard
- Base sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if base sheet is self-adhered)

APPROVED BASE SHEETS:

(one of the following)

- All Weather/Empire® Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED CAP SHEETS:

(one of the following)

- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:

For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:

- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

CertainTeed
SAINT-GOBAIN
Commercial Roofing

Consult CertainTeed General Recommendations for noted section references.

APPENDIX C

MODIFIED BITUMEN SBS ROOF OVER STEEL DECK SYSTEM PROTOCOL

BID PACKAGE

for

RE-ROOF INSTALLATION (Steel)

at

AMERICANA WAREHOUSE BUILDING
123 WASHINGTON AVENUE
ANYTOWN, FL - 33000

Prepared for

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

May 8, 2018

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INTRODUCTION

The subject property comprises of a warehouse building that was built in 1974. This 1-story warehouse building has a flat roof with a structural steel deck. The main flat roof is at an elevation of about 16 feet. The total roof area is approximately 10,000 sf. The main roof has a Modified Bitumen roof system over the steel deck. This specification addresses the removal of the existing roof down to the structural steel deck and the installation of a new CertainTeed Modified Bitumen roof system.

Quest Engineering Services & Testing, Inc. (QuEST) has prepared the following bid package for the new roof installation at the subject site. The new roof proposed is a CertainTeed Modified Bitumen SBS Roof System over Steel Decks. This roof system's Miami-Dade Notice of Acceptance No. is 17-1003.02 (Pages 20, 21 of 43, System Design Pressure -52.5 psf with Limitation #7). This system comprises of mechanically attached Insulation Boards, hot-mopped Flintlastic Poly SMS Ply Sheet and a hot-mopped Flintlastic GMS Cap Sheet.

SCOPE OF PROJECT

The scope of this project is to remove the existing roof down to the steel deck, inspect, clean (and repair if necessary) the existing roof deck and then install the new roof system in accordance with the Florida Building Code (2017). Prior to commencement of the re-roofing contractor shall verify existing steel deck attachment and joist anchoring. Damaged deck areas will need to be repaired and/or replaced. As a part of the new roof installation, the membrane should be draped up and over the parapet walls and a new coping cap installed. The owner reserves the right to request post-installation bell chamber tests (TAS-124) to assure that roof system has been installed in an acceptable manner. Failing areas will need to be repaired and retested at contractor's expense, before acceptance.

As this project's aim is to generate a reliable bid as it pertains to deck diaphragm improvements required by the new Florida Building Code (2017) associated with re-roofing on old buildings that were designed with wind codes pre-dating ASCE 7-88, we have eliminated work associated with RTUs and/or its upgrades. The contractor must install CertainTeed and FBC approved flashing around all roof penetrations and equipment curbs.

For purposes of this research project the steel deck is assumed to be sloped adequately to provide positive drainage. As indicated in the attached drainage evaluation, the existing primary drains and emergency overflow scuppers are adequate. Ensure that these scuppers are positioned such that their bottoms are not less than 2" nor more than 4" above roof level. Care should be taken to ensure that ponding water in excess of 5" does not occur at any time at any portion of the roof.

The information provided in these specifications is for general informational purposes only. The contractor is responsible for obtaining a re-roofing permit and coordinating with the Building Department for all necessary in-progress and final inspections. All testing and engineering necessary to obtain a permit and complete this job are the also the contractor's responsibility.

The roof contractor must be certified by CertainTeed Corp to install this roof system. The contractor must provide a 20-year NDL warranty on labor and materials. All work should be done in accordance with the Florida Building Code (2017), including applicable HVHZ protocols. All installation, product and safety guidelines of the roof system manufacturer, along with OSHA mandated safety guidelines should be followed. In case of conflicts, the more stringent standard should be followed.

Safety and Clean-Up

The contractor, its employees, representatives, agents and sub-contractors should observe all safety precautions as required by OSHA during the entire duration of this project. The contractor should also clean-up on a daily basis. This is an occupied facility and contractor must maintain the site in a presentable fashion at all times.

Insurance Requirements

The roofing contractor must maintain all necessary licenses and insurance certificates throughout the duration of the job.

Mail Sealed Bids:

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

Ph (352) 222 6147 Fax (561) 245 4447

Deadline: Bid Packages must be received by **5:00 PM on May 15, 2018.**

All technical questions concerning this bid package may be addressed directly to Quest Engineering Services & Testing, Inc. If there are any technical questions, please contact:

R. N. Sailappan, P.E., *Quest Engineering Services & Testing, Inc.*, **Ph (954) 582 9800**

REROOFING SPECIFICATIONS

This section outlines the general guidelines for the bidding and reproofing at the subject site. The guidelines under the general sub-section apply to the entire project.

General

1. Only those bidders on the invited bidders list are eligible to bid on this project.

2. All bidders must be licensed in the State of Florida and have a minimum of 5 years of experience providing such services.

3. The bid should also identify the bidder's contact person and contact information.

4. All bidders should maintain appropriate licenses and insurance requirements during the entire project duration. The liability insurance policy should name AMPCO as additional insured. The minimum insurance requirements are as follow:

Workman's Compensation	-	Statutory Limits
General Liability & Property Damage	-	$1,000,000.00

5. The bid packages should include the following:

   a) Bidder's Contact Information
   b) Filled out Bid Form with Cost Proposal for Roof Replacement with breakdowns for all 3 facets, namely:

      Deck Re-fastening to satisfy new diaphragm shear enhancements
      Enhance Edge Connections to satisfy new diaphragm shear enhancements
      Deck Replacement to satisfy new diaphragm shear enhancements

REQUIRED SUBMITTALS BY SELECTED CONTRACTOR

A. Prior to starting work, the roofing contractor must submit the following:

1. Shop drawings showing layout, details of construction and identification of materials.

2. A sample of the manufacturer's Membrane System Warranty.

3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.

4. Certification of the manufacturer's warranty reserve.

B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

BID FORM

Contractor:

Date till which Price is Valid:

Cost Proposal:

1. Base Bid for Roof Replacement $ _____

2. Fee for Investigating Deck Attachment to Joist Supports $ _____
   Cut and expose roofing on top side of deck at 4 locations
   (4' x 4' opening) to verify deck fastening

3. Fee for Deck Re-fastening (where required) – #12 TEK screws
   Installed at each flute; screwed in a 36/7 pattern
   Sidelap #10 screws at 12" o.c. $ _____
   Joists are spaced at 5' o.c. (i.e.) 31 Joists & 2 Bays

4. Fee for Investigating Deck Edge Attachment $ _____
   Cut and expose Drywall/drop-down ceiling along roof perimeter
   to verify deck edge fastening and Joist anchoring

5. Additional Cost for Enhanced Edge and Support Connections $ _____
   434 linear feet of perimeter; 124 Joist Bearing Points
   Install 3" x 3" x ¼" deck ledger angle all along roof deck perimeter
   secured to wall with Ø ½" expansion anchor bolts at 24" o.c.
   (bolts to have minimum 4" embedment into filled cell of wall) and
   to each joist with two Ø 3/8" bolts and nuts.

6. Unit Cost for Partial Deck Replacement $ _____
   Removal and disposal of damaged metal decks
   Grinding of welds/removal of screws
   Replacement deck to be 22 ga. and match the profile of existing deck
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)

7. Additional Cost for Full Deck Replacement $ _____
   Removal and disposal of existing metal decks
   Grinding of welds/removal of screws
   Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B'
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)

8. Associated Engineering Cost $ _____

All work will be done by licensed personnel after obtaining relevant permits, in accordance with the Florida Building Code (2017)

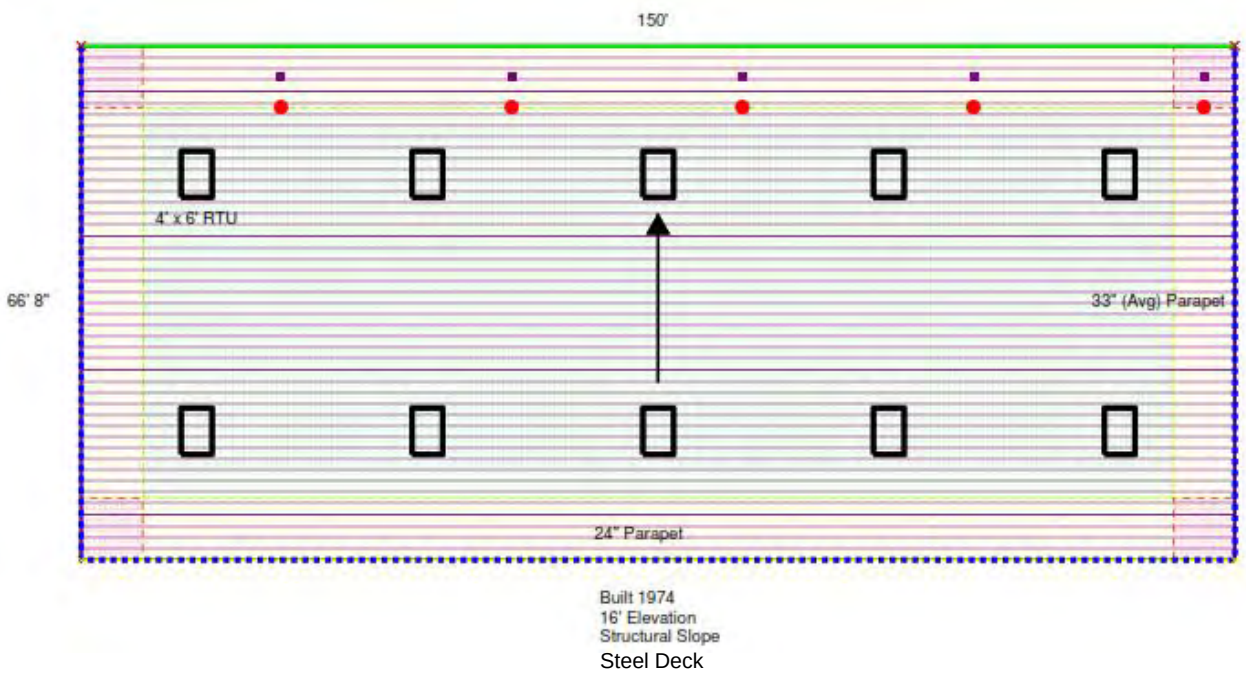
Bid acknowledged and submitted by:

Signature: _____

Name: _____

Firm Name: _____

Date: _____



N

Legend	Pitch	Description
	<none>	Perimeter
	0.25/12	Remove Mod Bit & Insltn
	0.25/12	Insltn 1.5 (ma) Plyiso & 1/2 Wd Fbr (mp)
	0.25/12	Insltn 1.5 (ma) Plyiso & 1/2 Wd Fbr (mp)
	0.25/12	Insltn 1.5 (ma) Plyiso & 1/2 Wd Fbr (mp)
	0.25/12	Mod Bit, Ply Bs, GMS (Insltn)
	<none>	1/2 Sht Flsh & Cant @ Curbs
	<none>	Flsh & Cant (ms) 24" HIgh Wall
	<none>	Flsh & Cant (ms) 33" (Avg) HIgh Wall
	0.25/12	VTR Flashing w/ 3" Lead Boot
	0.25/12	Vent 10" GRV
	0.25/12	End of Flsh Closure & Trim
	0.25/12	Metal Edge over Existing Gutter
	<none>	Coping (Cap) @ Parapet
	0.25/12	Coping End
	0.25/12	Coping Miter

QuEST

Quest Engineering Services & Testing, Inc.
2737 NW 19th Street
Pompano Beach, FL – 33069

Ph (954) 582 9800 **Fax (954) 582 9836**

Title:	**ROOF PLAN**
Project:	**Americana Building** **123 Washington Avenue** **Anytown, FL - 30000**
Client:	**UF College of Design, Construction & Planning**

Dimensions indicated are approximate. Contractor must field verify before bidding.

Scale: NTS

Project No.	Drawn	Sheet No.	Revision No.	Revision Date
J-17284	**RNS**	**1 of 1**		

INSULATION BOARD ATTACHMENT CALCULATIONS

Project Name Americana Warehouse Building **QuEST Report No.:** J-17284.004
Project Address 123 Washington Avenue
Anytown, FL - 33000

Deck Substrate	Steel	Insulated	Mean Roof Height	16.0	Feet
Configuration	Low Slope		Roof Area (Approx.)	10000	Sq.Ft.
Category	II		Roof Width	66.7	Feet
Exposure Condition	C		Perimeter Width	6.4	Feet
Building Type	Enclosed		Parapet Height	2.0	Feet
Base Wind Speed	175	mph	Corner Zones	6.4' x 6.4'	Each

Slope V 0.0 Slope H 12.0 Slope Angle° 0.00

Uplift Pressures q_z = 0.00256 K_z K_{zt} K_d V^2 P = q_z (GC_p - GC_{pi})

q_z	K_z	K_{zt}	K_d	V	GC_p	GC_{pi}	
57.630	0.860	1.005	0.85	175	-1.00	0.18	Field
					-1.80	0.18	Perimeter
					-2.80	0.18	Corner

Field	$P_{1\ ult.}$	-68.00 psf	$P_{1\ asd}$	-40.80 psf	
Perimeter	$P_{2\ ult.}$	-114.11 psf	$P_{2\ asd}$	-68.46 psf	
Corner	$P_{3\ ult.}$	-171.74 psf	$P_{3\ asd}$	-103.04 psf	

Proposed System CertainTeed Modified Bitumen Roof Systems over Steel Decks
Product Approval No. 17-1003.02 (Pages 20, 21 of 43)
System Design Pressure -52.5 psf

Insulation Board Dimensions 4' x 4' x 1.5" (Min. Thickness) Insulation Board Area 16 Sq.Ft.
Fasteners Approved Screws and Plates
Min. Fasteners per Board 12

Min. Characteristic Resistance Force -70.00 lbf Verify with TAS-105 Tests

No. of Fasteners Required NF = (Ins. Board Area x P_i) / MCRF

	Field	Perimeter	Corner
Fastener Requirement	9.33	15.65	23.55

RECOMMENDED INSULATION BOARD ATTACHMENT PATTERN

Field Use 12 Fasteners per 4' x 4' board
Perimeter Use 16 Fasteners per 4' x 4' board
Corner Use 24 Fasteners per 4' x 4' board

These calculations have been done in accordance with ASCE 7-10, based on the information provided by the contractor. The roof system should be installed in accordance with the FBC & manufacturer's recommendations. We recommend TAS-105 tests to verify that above MCRF may be realized, before installing new roof.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

Quest Engineering Services & Testing, Inc. (CA # 7954), 2737 NW 19 St., Pompano Beach, FL-33069 Ph (954) 582 9800 Fax (954) 582 9836

DRAINAGE EVALUATION

Project Name Americana Warehouse Building
Project Address 123 Washington Avenue
Anytown, FL - 33000

Report No.: J-17284.002

The following values are from the Florida Building Code (2010), Plumbing Code, for a 5" per hour rainfall rate

Vertical Leaders	Pipe Ø	2"	3"	4"	5"	6"	8"	
Table 1106.2(1)	Roof Area	575	1760	3680	6920	10800	23200	
Horizontal Piping	Pipe Ø		3"	4"	5"	6"	8"	10"
Table 1106.3	Roof Area		657	1504	2672	4280	9200	16580
Table 1106.7	Length	4"	6"	8"	12"	16"	20"	24"
Weirs (4" Head)	Roof Area	1794	2692	3589	5384	7179	8974	10769
Weirs (3" Head)	Roof Area	1153	1730	2307	3461	4615	5769	6923

ROOF DETAILS

Mean Roof Height 16.0 Feet
Slope V 1/8" : 12

Roof Area (Approx.) 10000 Sq.Ft.
Tributary Roofs 0 Sq.Ft.

		Length (ft)	Height (ft)
Side Walls	1	0	0
	2	0	0
	3	0	0

		Length (ft)	Height (ft)
Parapets	1	434	2
	2	0	0
	3	0	0

Effective Roof Area for Drainage purposes 10434 ft^2

PRIMARY	VERTICAL DRAINS Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1	3.50	9.62	5	11975
Type 2				
Type 3				

THROUGH-WALL SCUPPERS (WEIRS)	Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

SECONDARY	VERTICAL Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

THROUGH-WALL SCUPPERS (WEIRS)	Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1	4	12.00	4	13844
Type 2				
Type 3				

Total Primary Drain Capacity of Existing Drains 11975 ft^2 Adequate

Total Secondary Drain Capacity of Existing Scuppers 13844 ft^2 Adequate

These calculations have been done in accordance with FBC (2017), based on the information provided by the contractor. Position drainage elements such that no more than 5" of ponding occurs anywhere on roof at any time.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786)315-2590 F (786) 31525-99
www.miamidade.gov/economy

NOTICE OF ACCEPTANCE (NOA)

CertainTeed Corporation
20 Moores Road
Malvern, PA 19355

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: CertainTeed Modified Bitumen Roof Systems over Steel Decks.

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA renews NOA# 13-1211.08 and consists of pages 1 through 43.
The submitted documentation was reviewed by Alex Tigera.

MIAMI-DADE COUNTY APPROVED

NOA No.: 17-1003.02
Expiration Date: 01/02/23
Approval Date: 12/28/17
Page 1 of 43

ROOFING SYSTEM APPROVAL

Category:	Roofing
Sub-Category:	Modified
Material:	APP, SBS
Deck Type:	Steel
Maximum Design Pressure:	**-172.5 psf.**

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
All Weather/Empire Base Sheet	39 3/8" x 65'10"; Roll weight: 70 lbs. (2 squares)	ASTM D 4601, Type II UL Type G2	Asphalt coated, fiberglass reinforced base sheet.
Flexiglas Base Sheet	39 3/8" x 98'9"; Roll weight: 90 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Modified Bitumen coated fiberglass base sheet.
Flintlastic Base 20	39 3/8" x 49'6"; Roll weight: 90 lbs. (1.5 squares)	ASTM D 6163, Grade S, Type I	Modified Bitumen coated fiberglass base sheet.
Flintglas Ply Sheet Type IV	39 3/8" x 164'7"; Roll weight: 38 lbs. (5 squares)	ASTM D 2178, Type IV UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintglas Premium Ply Sheet Type VI	39 3/8" x 164'7"; Roll weight: 40 lbs. (5 squares)	ASTM D 2178, Type VI UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintlastic STA	39 3/8" x 32'10"; Roll weight: 87 lbs. (1 square)	ASTM D 6222, Grade S, Type I	Smooth surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA-FR	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GMS	39 3/8" x 32' 10"; Roll weight: 94 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic Premium FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic FR Dual Cap	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6162, Grade G, Type I	Granule surfaced SBS modified bitumen membrane with a nonwoven polyester/fiberglass composite mat reinforcement for use in cold or mop applications.
Flintlastic FR Cap 30	39 3/8" x 32' 10"; Roll weight: 86 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications.
Flintlastic FR Cap 30 T	39 3/8" x 32'10"; Roll weight: 100 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for torch application.
Flintlastic Base 20 T	39 3/8" x 33'; Roll Weight: 81 lbs. (1 square)	ASTM D 6163, Grade S, Type I	Modified Bitumen, coated fiberglass base sheet for torch application.
Flintlastic FR Cap 30 CoolStar	39 3/8" x 32' 10"; Roll weight: 88 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic FR Cap 30 T CoolStar	39 3/8" x 32' 10"; Roll weight: 102 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for torch applications. Covered with reflective CoolStar Coating.
Flintlastic GTA CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic GTA-FR CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.
Flintlastic GMS CoolStar	39 3/8" x 32' 10"; Roll weight: 97 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Premium FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Ultra Poly SMS Base Sheet	39 3/8" x 32' 10"; Roll weight: 90 lbs. (1 square)	ASTM D 6164, Grade S, Type I	Smooth surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop applications.
Glasbase Base Sheet	39 3/8" x 98'9"; Roll weight: 75 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Asphalt coated, fiberglass base sheet.
Flintlastic Poly SMS Base Sheet	39 3/8" x 64' 3"; Roll weight: 90 lbs. (2 squares)	ASTM D 4601, Grade S, Type II UL Type G2	Modified Bitumen coated polyester base sheet.
Yosemite Venting Base Sheet	39 3/8" x 32'10"; Roll weight: 85 lbs. (1 square)	ASTM D 3909 ASTM D 4897, Type II, UL G3	Mineral Surfaced fiberglass reinforced buffer sheet.
Flintlastic APP Base T	39 3/8" x 65' 4"; Roll weight: 100 lbs. (2 squares)	ASTM D6509	Modified Bitumen coated fiberglass base sheet.
Flintlastic Ultra Glass SA	39 3/8" x 33'11"; Roll weight: 73 lbs. (1 square)	ASTM D1970	Self-adhering, fiberglass reinforced, SBS modified bitumen base/ply sheet.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Black Diamond™ Base Sheet	36" x 68'7"; Roll weight: 78 lbs. (2 squares)	ASTM D 1970	Self-adhering fiberglass reinforced modified bitumen base sheet
FlintBond Brush	5 gallon pails	ASTM D3019	Cold applied, SBS polymer modified asphalt adhesive.

APPROVED INSULATIONS:

TABLE 2

Product Name	Product Description	Manufacturer (With Current NOA)
FlintBoard ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
FlintBoard ISO Cold	Polyisocyanurate foam insulation	CertainTeed Corp.
$FlintBoard_H$ ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
$FlintBoard_H$ ISO WF	Polyisocyanurate foam insulation	CertainTeed Corp.
$FlintBoard_H$ ISO NB	Polyisocyanurate foam insulation	CertainTeed Corp.
$FlintBoard_H$ ISO Cold	Polyisocyanurate foam insulation	CertainTeed Corp.
Structodek High Density Fiberboard Roof Insulation	Wood fiber insulation board	Blue Ridge Fiberboard, Inc.
FescoBoard	Expanded perlite and fiber insulation	Johns Manville Corp.
Insulfoam EPS	Type IX expanded polystyrene Insulation	Insulfoam, a Div. of Carlisle Const. Materials
DensDeck	Water resistant gypsum board	Georgia-Pacific Gypsum LLC
DensDeck Prime	Water resistant gypsum board	Georgia-Pacific Gypsum LLC
H-Shield	Polyisocyanurate foam insulation	Hunter Panels, LLC
H-Shield WF	Polyisocyanurate foam insulation	Hunter Panels, LLC
H-Shield NB	Polyisocyanurate foam insulation	Hunter Panels, LLC
H-Shield-CG	Polyisocyanurate foam insulation	Hunter Panels, LLC
ENRGY 3	Polyisocyanurate foam insulation	Johns Manville Corp.
ENRGY 3 25 PSI	Polyisocyanurate foam insulation	Johns Manville Corp.
Multi-Max FA-3	Polyisocyanurate roof insulation	RMax Operating, LLC
ACFoam-II	Polyisocyanurate foam insulation	Atlas Roofing Corp.
ACFoam-III	Polyisocyanurate foam insulation	Atlas Roofing Corp.
SECUROCK Gypsum-Fiber Roof Board	Gypsum insulation	United States Gypsum Corp.

APPROVED FASTENERS/ADHESIVES:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
1.	Dekfast DF-#12-PH3	Insulation fastener	various	SFS Group USA, Inc.
2.	Dekfast DF-#14-PH3	Insulation fastener	various	SFS Group USA, Inc.
3.	Dekfast PLT-H-2-7/8	Galvalume AZ50 steel plate	2 7/8" x 3 ¼"	SFS Group USA, Inc.
4.	Dekfast PLT-R-3	Galvalume AZ50 stress plate	3" x .018"	SFS Group USA, Inc.
5.	OMG 3" Galvalume Steel Plate	Galvalume stress plate	3" round	OMG, Inc.
6.	#12 Standard Roofgrip	Insulation fastener for wood and steel.	various	OMG, Inc.
7.	#14 Roofgrip Fasteners	Insulation fastener for wood and steel.	various	OMG, Inc.
8.	3 in. Ribbed Galvalume Plate	Galvalume stress plate.	3" round	OMG, Inc.
9.	AccuTrac Plate	Galvalume stress plate.	3" square	OMG, Inc.
10.	OMG 3 in. Round Metal Plates	Galvalume AZ50 steel plate	3" round	OMG, Inc.
11.	Flat Bottom Metal Plate	Aluminized stress plate	3" square	OMG, Inc.
12.	Trufast #14 HD Fastener	Insulation fastener for wood and steel decks	various	Altenloh, Brinck & Co. U.S., Inc.
13.	Trufast 3" Metal Insulation Plate	Galvalume AZ50 steel plate	3" round	Altenloh, Brinck & Co. U.S., Inc.
14.	Trufast 2.4" Barbed Metal Seam Plates	Galvalume AZ50 steel plate	2.4" round	Altenloh, Brinck & Co. U.S., Inc.
15.	Trufast #12 DP Fastener	Coated, carbon steel screw	various	Altenloh, Brinck & Co. U.S., Inc.
16.	Dekfast DF-#15-PH3	Coated, carbon steel fastener	various	SFS Group USA, Inc.
17.	Trufast #15 EHD Fastener	Coated, carbon steel screw	various	Altenloh, Brinck & Co. U.S., Inc.
18.	Dekfast PLT-P-R-3	Polypropylene round stress plate	3" round	SFS Group USA, Inc.
19.	FlintFast #12	Coated, carbon steel screw	various	CertainTeed Corp.
20.	FlintFast #14	Insulation fastener for wood and steel decks	various	CertainTeed Corp.
21.	FlintFast 3" Insulation Plate	Galvalume AZ50 steel plate	3" round	CertainTeed Corp.
22.	OMG Heavy Duty	Insulation fastener for use in wood, steel or concrete decks	various	OMG, Inc.
23.	Millennium One Step Foamable Adhesive	Polyurethane two component low rise insulation adhesive	1.5 litres	Adco Products, Inc. d.b.a. Royal Adhesives and Sealants, Inc.

APPROVED FASTENERS/ADHESIVES:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
24.	Millennium PG-1 Low Viscosity Insulation Adhesive	Polyurethane two component low rise insulation adhesive	1.5 litres	Adco Products, Inc. d.b.a. Royal Adhesives and Sealants, Inc.
25.	ICP Adhesive CR-20	Polyurethane two component low rise insulation adhesive	Two kits (A= 40lb and B= 35lb cylinders)	ICP Adhesives & Sealants, Inc.
26.	Pliodeck Insulation Adhesive	Polyurethane one component low VOC adhesive system		Ashland, Inc.
27.	Insta Stik Quik Set Insulation	Polyurethane one component moisture curing adhesive	It is supplied in pressurized cylinders with a net weight of 23 lbs., with a total unit weight of 30 lbs.	The Dow Chemical Company
28.	OMG OlyBond 500 Adhesive	Spray polyurethane foam insulation adhesive	10 gal. bag-in-box set and 1.5 liters SpotShot cartridge	OMG, Inc.
29.	OMG OlyBond 500 Green Adhesive	Spray polyurethane foam insulation adhesive	10 gal. bag-in-box set and 1.5 liters SpotShot cartridge	OMG, Inc.

APPROVED SURFACING/COATING OPTIONS:

TABLE 4

Chosen components must be applied according to manufacturer's application instructions. Any coating, listed below, used as a surfacing, must be listed within a current NOA.

System Number	Manufacturer	Application
1.	Generic	Gravel applied at 400 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
2.	Generic	Slag applied at 300 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
3.	Karnak Corp.	Karnak (#97 AF) Fibrated Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
4.	CertainTeed Corp.	FlintCoat A-150 applied at an application rate of 1.5 gal/sq.
5.	Gardner Asphalt Corp.	APOC #212 Fibered Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
6.	Gardner Asphalt Corp.	APOC #400 Sunbrite applied at an application rate of 3 gal./sq.

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
Factory Mutual Research Corp.	FM 4470	3Y8A1.AM	03/23/96
	FM 4470	0D3A3.AM	04/04/97
	FM 4470	2D0A0.AM	12/23/98
	FM 4470	1D7A4.AM	11/09/98
	FM 4470	3028410	02/19/07
	FM 4470	3031350	09/27/07
	FM 4470	3039046	06/15/10
	FM 4470	3039848	12/02/11
	FM 4470	3046104	08/13/13
	FM 4470	3048520	09/19/13
Underwriters Laboratories, Inc.	UL 790	R11656	10/25/12
United States Testing Company	ASTM D5147	97-457-R2	12/02/87
	ASTM D5147	97457-4	06/03/88
Momentum Technologies, Inc.	ASTM D6164	AX31G8F	06/05/09
Trinity|ERD	TAS 117	3515.07.03	07/22/03
	FM 4470, TAS 114	3533.01.06	01/06/06
	TAS 114 (H)	Letter	04/05/06
	TAS 117 (B)	3503.10.06	10/10/06
	TAS 117 (B)	O6490.04.07-R1	06/27/07
	FM 4470, TAS 114	3521.07.04-R1	10/26/07
	TAS 117 (B)/ASTM D6862	C8500SC.11.07	11/30/07
	FM 4470, TAS 114	C8370.08.08	08/19/08
	TAS 114 / TAS 117	C30310.12.09	12/17/09
	ASTM D6163/6164/6222/3909	C10080.09.08-R4	03/25/10
	TAS 117 B	C35500.02.11	02/09/11
	TAS 114	3513.08.02-R1	03/17/11
	ASTM D1876, TAS 114 (H), TAS 117 (B)	C42110.08.12	08/13/12
	ASTM D1970	C40050.09.12-2	09/28/12
	ASTM D5147/4798	C31410.10.10-R1	11/01/12
	ASTM D5147/4798	C31410.01.11-1-R1	11/01/12
	ASTM D4798	C31410.01.11-2A-R1	02/21/13
	ASTM D4798	C31410.12.13	12/05/13
	ASTM D6222	C40050.12.13-R1	12/31/13
	ASTM D1876, TAS 114 (H), FM 4474	C47320.03.14	03/26/14
	ASTM D1876, TAS 114 (H), FM 4474	C45620.03.14	03/27/14
	ASTM D1876	C35460.05.11-R1	05/20/15
	ASTM D4601-04 (2012), Type II	CTR-SC11145.09.16-3A	09/19/16

PRI Construction Materials Technologies LLC	ASTM D6163	CTC-066-02-01	08/09/11
	ASTM D6222	CTC-071-02-01	08/08/11
	ASTM D6222	CTC-070-02-01	08/09/11
	ASTM D6164/4798	CTC-093-02-01	08/09/11
	ASTM D4601	CTC-126-02-01	03/12/12
	ASTM D2178	CTC-122-02-01	03/13/12
	ASTM D2178	CTC-123-02-01	03/13/12
	ASTM D6509	CTC-116-02-01	04/04/12
	ASTM D6163	CTC-128-02-01	06/11/12
	ASTM D6163	CTC-129-02-01	06/11/12
	ASTM D6164	CTC-132-02-01	06/11/12
	ASTM D6164	CTC-162-02-01	05/09/13
	ASTM D6164	CTC-161-02-01	05/09/13
	ASTM D6162	CTC-183-02-01	10/02/13
	ASTM D6164	CTC-190-02-01	12/02/13
	ASTM D4601	CTC-321-02-01	8/22/17
	ASTM D 6163	CTC-319-02-01	08/22/17
	ASTM D1970	CTC-320-02-01	08/28/17

DECK STRESS ANALYSIS CALCULATIONS/REPORTS

Engineer/Agency	Identifier	Assemblies	Date
Factory Mutual Research Corp.	RoofNav Listings	B(2), C(4), C(8), C(10)	01/01/13
Robert Nieminen, P.E.	Signed/Sealed Calculations	B(1), B(5) through B(7), C(3), C(5), C(6) through C(7), C(9), D(1) through D(4)	08/31/17

Membrane Type:	SBS Modified
Deck Type 2I:	Steel, Insulated
Deck Description:	18-22 ga., Type B, Grade 33 steel deck is secured at 5 ft. o.c. spans with 5/8" paddle welds with weld washers or with Teks 4 fasteners spaced 6" o.c. Side laps are secured with Teks 1 fasteners at 30" o.c. **This Tested Assembly has been analyzed for allowable deck stress. See Evidence Submitted Table.**
System Type B(6):	Base layer of insulation mechanically fastened, top layer adhered with approved asphalt.

All General and System Limitations apply.

One or more layers of any of the following insulations.

Base Insulation Layer	Insulation Fasteners (Table 3)	Fastener Density/ft^2
ACFoam-II, ENRGY 3, Multi-Max FA-3, FlintBoard ISO, H-Shield, FlintBoard$_H$ ISO **Minimum 1.5" thick**	**1, 2, 6, 7, 12**	**1:1.33**

Note: Base layer shall be mechanically attached with fasteners and density described. Insulation panels listed are minimum sizes and dimensions; if larger panels are used the number of fasteners per board shall be increased maintaining the same fastener density (See Roofing Application Standard RAS 117 for fastening details).

Top Insulation Layer	Insulation Fasteners (Table 3)	Fastener Density/ft^2
FescoBoard **Minimum ¾" thick**	**N/A**	**N/A**
Stuctodek High Density Fiberboard Roof Insulation **Minimum ½" thick**	**N/A**	**N/A**

Note: Top layer of insulation shall be adhered with approved asphalt within the EVT range and at a rate of 20-40 lbs/100 ft^2. Please refer to Roofing Application Standard RAS 117 for insulation attachment. Composite insulation boards used as a top layer shall be installed with the polyisocyanurate face down.

Base Sheet:	One ply of All Weather/Empire Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet, Flintglas Ply Sheet Type IV or Flintglas Premium Ply Sheet Type VI adhered to the insulated substrate with approved mopping asphalt applied within the EVT range and at a rate of 20-40 lbs./sq.
Ply Sheet: (Optional)	One ply of All Weather/Empire Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet or one or more plies of Flintglas Ply Sheet Type IV or Flintglas Premium Ply Sheet Type VI adhered with approved mopping asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or one ply of Black Diamond Base Sheet or Flintlastic Ultra Glass SA self-adhered or Flintlastic Ultra Poly SMS Base Sheet torch applied.

Membrane:	One ply of Flintlastic GMS, Flintlastic GMS CoolStar, Flintlastic FR Dual Cap, Flintlastic FR-P, Flintlastic FR-P CoolStar, Flintlastic Premium FR-P, Flintlastic Premium FR-P CoolStar, Flintlastic FR Cap 30, Flintlastic FR Cap 30 CoolStar adhered to ply sheet with approved mopping asphalt applied within the EVT range and at a rate of 20 to 40 lbs./sq. or Flintlastic FR Cap 30 T or Flintlastic FR Cap 30 T CoolStar torch adhered to ply sheet.
Surfacing: (Optional)	Any of the approved surfacing/coating options listed in Table 4
Maximum Design Pressure:	-52.5 psf. (For FescoBoard) (See General Limitation #7) -67.5 psf. (For Structodek High Density Fiberboard Roof Insulation) (See General Limitation #7)

STEEL DECK SYSTEM LIMITATIONS:

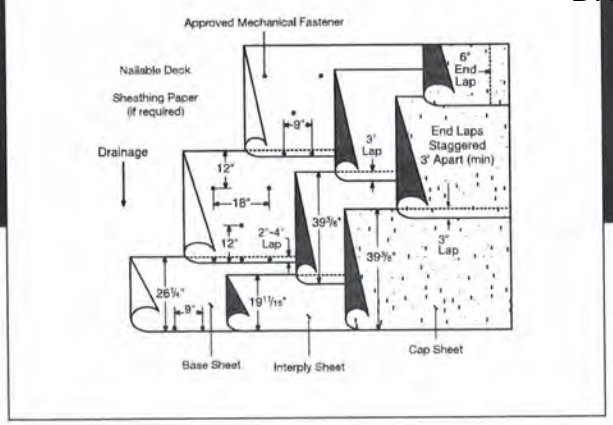
1. If mechanical attachment to the structural deck through the lightweight insulating concrete is proposed, a field withdrawal resistance testing shall be performed to determine equivalent or enhanced fastener patterns and density. All testing and fastening design shall be in compliance with Testing Application Standard TAS 105 and Roofing Application Standard RAS 117, calculations shall be signed and sealed by a Florida registered Professional Engineer, Registered Architect or Registered Roof Consultant.
2. For steel deck application where specific deck construction is not referenced: The deck shall be a minimum 22 gage attached with 5/8" puddle welds with weld washers at every flute with maximum deck spans of 5 ft. o.c.

GENERAL LIMITATIONS:

1. Fire classification is not part of this acceptance; refer to a current Approved Roofing Materials Directory for fire ratings of this product.
2. Insulation may be installed in multiple layers. The first layer shall be attached in compliance with Product Control Approval guidelines. All other layers shall be adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or mechanically attached using the fastening pattern of the top layer
3. All standard panel sizes are acceptable for mechanical attachment. When applied in approved asphalt, panel size shall be 4' x 4' maximum.
4. An overlay and/or recovery board insulation panel is required on all applications over closed cell foam insulations when the base sheet is fully mopped. If no recovery board is used the base sheet shall be applied using spot mopping with approved asphalt, 12" diameter circles, 24" o.c.; or strip mopped 8" ribbons in three rows, one at each side lap and one down the center of the sheet allowing a continuous area of ventilation. Encircling of the strips is not acceptable. A 6" break shall be placed every 12' in each ribbon to allow cross ventilation. Asphalt application of either system shall be at a minimum rate of 12 lbs./sq.
   Note: Spot attached systems shall be limited to a maximum design pressure of -45 psf.
5. Fastener spacing for insulation attachment is based on a Minimum Characteristic Force (F') value of 275 lbf., as tested in compliance with Testing Application Standard TAS 105. If the fastener value, as field-tested, are below 275 lbf. insulation attachment shall not be acceptable.
6. Fastener spacing for mechanical attachment of anchor/base sheet or membrane attachment is based on a minimum fastener resistance value in conjunction with the maximum design value listed within a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing, prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect or Registered Roof Consultant may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standards TAS 105 and calculations in compliance with Roofing Application Standard RAS 117.
7. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased for both insulation and base sheet as calculated in compliance with Roofing Application Standard RAS 117. Calculations prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect or Registered Roof Consultant **(When this limitation is specifically referred within this NOA, General Limitation #9 will not be applicable.)**
8. All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform to Roofing Application Standard RAS 111 and applicable wind load requirements.
9. The maximum designed pressure limitation listed shall be applicable to all roof pressure zones (i.e. field, perimeters, and corners). Neither rational analysis, nor extrapolation shall be permitted for enhanced fastening at enhanced pressure zones (i.e. perimeters, extended corners and corners). **(When this limitation is specifically referred within this NOA, General Limitation #7 will not be applicable.)**
10. All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

END OF THIS ACCEPTANCE

SBS-N-3-A



Base sheet, one interply sheet and an SBS modified cap sheet

SUBSTRATE:
- Nailable (mechanically attached, Sec. 3.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
Approved base sheet, mechanically attached to approved substrate (Sec. 15.0).

Approved interply sheet set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- Base sheet (1 ply)
- Interply sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if interply is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED INTERPLY SHEETS:
(one of the following)
- All Weather/ Empire Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas Base Sheet
- Flintlastic Base 20
- Flintglas® Ply 4
- Flintglas Premium Ply 6
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

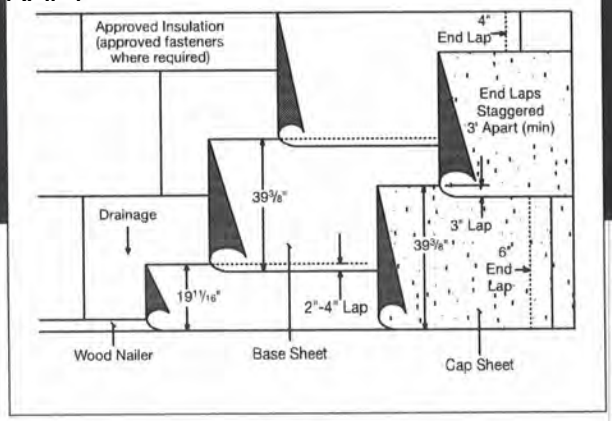
WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed SAINT-GOBAIN
Commercial Roofing

SBS-I-2-A



Insulated substrates: base sheet and an SBS modified cap sheet

SUBSTRATE:
- Steel and nailable (mechanically attached, Sec. 15.4)
- Non-nailable (adhered, Sec. 4.0)
- Insulation (Sec. 4.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
One or more layers of approved insulation and/or coverboard:
- Base layer mechanically attached and additional layers mechanically attached or adhered in hot asphalt or approved adhesive.
- Base layer and additional layers adhered in hot asphalt or approved adhesive.
- Vapor retarder/anchor sheets (Sec. 4.7).

Approved base sheet, set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- One or more layers of insulation and/ or coverboard
- Base sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if base sheet is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed SAINT-GOBAIN
Commercial Roofing

APPENDIX D

MODIFIED BITUMEN ROOF SYSTEM OVER GYPSUM DECK PROTOCOL

BID PACKAGE

for

RE-ROOF INSTALLATION (Gypsum)

at

AMERICANA WAREHOUSE BUILDING
123 WASHINGTON AVENUE
ANYTOWN, FL - 33000

Prepared for

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

May 8, 2018

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INTRODUCTION

The subject property comprises of a warehouse building that was built in 1974. This 1-story warehouse building has a flat roof with a structural gypsum deck. The main flat roof is at an elevation of about 16 feet. The total roof area is approximately 10,000 sf. The main roof has a Modified Bitumen roof system over the gypsum deck. This specification addresses the removal of the existing roof down to the poured gypsum deck and the installation of a new CertainTeed Modified Bitumen roof system.

Quest Engineering Services & Testing, Inc. (QuEST) has prepared the following bid package for the new roof installation at the subject site. The new roof proposed is a CertainTeed Modified Bitumen SBS Roof System over Gypsum Decks. This roof system's Miami-Dade Notice of Acceptance No. is 17-1003.08 (Page 24 of 25, System Design Pressure -60 psf with Limitation #7). This system comprises of a mechanically attached Flexiglas Base Sheet, hot-mopped Flintlastic Poly SMS Ply Sheet and a hot-mopped Flintlastic GMS Cap Sheet.

SCOPE OF PROJECT

The scope of this project is to remove the existing roof down to the gypsum deck, inspect, clean (and repair if necessary) the existing roof deck and then install the new roof system in accordance with the Florida Building Code (2017). Prior to commencement of the re-roofing contractor shall verify existing gypsum deck condition and joist anchoring. Damaged deck areas will need to be repaired and/or replaced. As a part of the new roof installation, the membrane should be draped up and over the parapet walls and a new coping cap installed. The owner reserves the right to request post-installation bell chamber tests (TAS-124) to assure that roof system has been installed in an acceptable manner. Failing areas will need to be repaired and retested at contractor's expense, before acceptance.

As this project's aim is to generate a reliable bid as it pertains to deck diaphragm improvements required by the new Florida Building Code (2017) associated with re-roofing on old buildings that were designed with wind codes pre-dating ASCE 7-88, we have eliminated work associated with RTUs and/or its upgrades. The contractor must install CertainTeed and FBC approved flashing around all roof penetrations and equipment curbs.

For purposes of this research project, the gypsum deck is assumed to be sloped adequately to achieve positive drainage. As indicated in the attached drainage evaluation, the existing primary drains and emergency overflow scuppers are adequate. Ensure that these scuppers are positioned such that their bottoms are not less than 2" nor more than 4" above roof level. Care should be taken to ensure that ponding water in excess of 5" does not occur at any time at any portion of the roof.

The information provided in these specifications is for general informational purposes only. The contractor is responsible for obtaining a re-roofing permit and coordinating with the Building Department for all necessary in-progress and final inspections. All testing and engineering necessary to obtain a permit and complete this job are the also the contractor's responsibility.

The roof contractor must be certified by CertainTeed Corp to install this roof system. The contractor must provide a 20-year NDL warranty on labor and materials. All work should be done in accordance with the Florida Building Code (2017), including applicable HVHZ protocols. All installation, product and safety guidelines of the roof system manufacturer, along with OSHA mandated safety guidelines should be followed. In case of conflicts, the more stringent standard should be followed.

Safety and Clean-Up

The contractor, its employees, representatives, agents and sub-contractors should observe all safety precautions as required by OSHA during the entire duration of this project. The contractor should also clean-up on a daily basis. This is an occupied facility and contractor must maintain the site in a presentable fashion at all times.

Insurance Requirements

The roofing contractor must maintain all necessary licenses and insurance certificates throughout the duration of the job.

Mail Sealed Bids:

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

Ph (352) 222 6147 Fax (561) 245 4447

Deadline: Bid Packages must be received by **5:00 PM on May 15, 2018.**

All technical questions concerning this bid package may be addressed directly to Quest Engineering Services & Testing, Inc. If there are any technical questions, please contact:

R. N. Sailappan, P.E., *Quest Engineering Services & Testing, Inc.*, **Ph (954) 582 9800**

REROOFING SPECIFICATIONS

This section outlines the general guidelines for the bidding and reproofing at the subject site. The guidelines under the general sub-section apply to the entire project.

General

1. Only those bidders on the invited bidders list are eligible to bid on this project.

2. All bidders must be licensed in the State of Florida and have a minimum of 5 years of experience providing such services.

3. The bid should also identify the bidder's contact person and contact information.

4. All bidders should maintain appropriate licenses and insurance requirements during the entire project duration. The liability insurance policy should name AMPCO as additional insured. The minimum insurance requirements are as follow:

Workman's Compensation	-	Statutory Limits
General Liability & Property Damage	-	$1,000,000.00

5. The bid packages should include the following:

   a) Bidder's Contact Information
   b) Filled out Bid Form with Cost Proposal for Roof Replacement with breakdowns for all 3 facets, namely:

      Deck testing to verify adequacy of gypsum deck to receive new roof
      Enhance Edge Connections to satisfy new diaphragm shear enhancements
      Deck Replacement to satisfy new diaphragm shear enhancements

REQUIRED SUBMITTALS BY SELECTED CONTRACTOR

A. Prior to starting work, the roofing contractor must submit the following:

1. Shop drawings showing layout, details of construction and identification of materials.

2. A sample of the manufacturer's Membrane System Warranty.

3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.

4. Certification of the manufacturer's warranty reserve.

B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

BID FORM

Contractor:

Date till which Price is Valid:

Cost Proposal:

1. Base Bid for Roof Replacement $ _____
2. Fee for Fastener Withdrawal Tests (TAS-105) $ _____
   Cut, test and patch all test locations
3. Fee for Investigating Deck Edge Attachment $ _____
   Cut and expose Drywall/drop-down ceiling along roof perimeter
   to verify deck edge fastening and Joist anchoring
4. Additional Cost for Enhanced Edge and Support Connections $ _____
   434 linear feet of perimeter; 124 Joist Bearing Points
   Install 3" x 3" x ¼" deck ledger angle all along roof deck perimeter
   secured to wall with Ø ½" expansion anchor bolts at 24" o.c.
   (bolts to have minimum 4" embedment into filled cell of wall) and
   to each joist with two Ø 3/8" bolts and nuts.
5. Unit Cost for Partial Deck Replacement $ _____
   Removal of damaged gypsum deck and its disposal
   Grinding of welds/removal of bulb Ts
   Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B'
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)
   Install ISO insulation to match Gypsum Deck thickness
6. Additional Cost for Full Deck Replacement $ _____
   Removal of gypsum deck and its disposal
   Grinding of welds/removal of bulb Ts
   Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B'
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)
   Install 1.5" thick ISO insulation
7. Associated Engineering Cost $ _____

All work will be done by licensed personnel after obtaining relevant permits, in accordance with the Florida Building Code (2017)

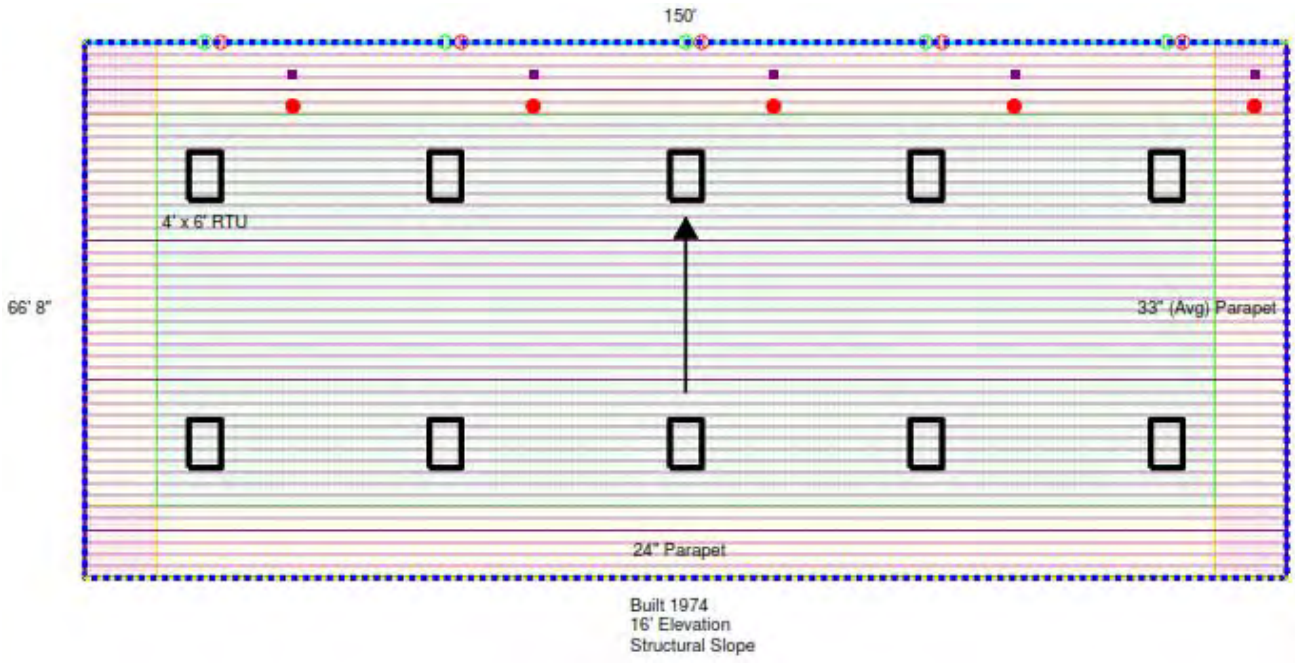
Bid acknowledged and submitted by:

Signature: _____

Name: _____

Firm Name: _____

Date: _____



Legend	Pitch	Description
	<none>	Perimeter
	0.25/12	Remove Mod Bit
	0.25/12	Glass Base Nld (Gyp)
	0.25/12	Glass Base Nld (Gyp)
	0.25/12	Glass Base Nld (Gyp)
	0.25/12	Mod Bit, Ply Bs, GMS (Bs Sht)
	0.25/12	Cricket,1/2" Slope, 2x4, 2 bds,
	<none>	1/2 Sht Flsh & Cant @ Curbs
	<none>	Flsh & Cant (ms) 24" HIgh Wall
	<none>	Flsh & Cant (ms) 33" (Avg) HIgh Wall
	<none>	Flsh & Cant (ms) 41" HIgh Wall
	0.25/12	VTR Flashing w/ 3" Lead Boot
	0.25/12	Vent 10" GRV
	0.25/12	Scupper,Through Wall
	0.25/12	Scupper,Overflow Through Wall
	<none>	Coping Cap @ Parapet
	0.25/12	Coping Miter

QuEST

Quest Engineering Services & Testing, Inc.
2737 NW 19th Street
Pompano Beach, FL – 33069

Ph (954) 582 9800 **Fax (954) 582 9836**

Title:	**ROOF PLAN**
Project:	**Americana Building** **123 Washington Avenue** **Anytown, FL - 30000**
Client:	**UF College of Design, Construction & Planning**

Dimensions indicated are approximate. Contractor must field verify before bidding.

Scale: NTS

Project No.	Drawn	Sheet No.	Revision No.	Revision Date
J-17284	**RNS**	**1 of 1**		

BASE SHEET ATTACHMENT CALCULATIONS

Project Name Americana Warehouse Building **Report No.:** J-17284.005
Project Address 123 Washington Avenue
Anytown, FL - 30000

Deck Substrate	Gypsum	Non-Insulated	Mean Roof Height	16.0	Feet
Configuration	Low Slope		Roof Area (Approx.)	10000	Sq.Ft.
Category	II		Roof Width	66.7	Feet
Exposure Condition	C		Perimeter Width	6.4	Feet
Building Type	Enclosed		Parapet Height	2.0	Feet
Base Wind Speed	170	mph	Corner Zones	6.4' x 6.4'	Each

Slope V 0.0 Slope H 12.0 Slope Angle° 0.00

Uplift Pressures $q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2$ $P = q_z\ (GC_p - GC_{pi})$

q_z	K_z	K_{zt}	K_d	V	GC_p	GC_{pi}	
54.384	0.860	1.005	0.85	170	-1.00	0.18	Field
					-1.80	0.18	Perimeter
					-2.80	0.18	Corner

Field	$P_{1\ ult.}$	-64.17 psf	$P_{1\ asd}$	-38.50 psf	
Perimeter	$P_{2\ ult.}$	-107.68 psf	$P_{2\ asd}$	-64.61 psf	
Corner	$P_{3\ ult.}$	-162.06 psf	$P_{3\ asd}$	-97.24 psf	

Proposed System CertainTeed Modified Bitumen Roof System over Poured Gypsum Decks
Product Approval No. 17-1003.08 (Page 24 of 25) Fastening #2
System Design Pressure -60 psf

Fasteners Trufast Twin Loc-Nail Assembled Fasteners

Base Sheet Width	39	inches	Side Lap	4	inches	Net Width	35 inches
Fastener Spacing in	Lap of Base Sheet		9	inches		# Rows	1
Fastener Spacing in	Field of Base Sheet		9	inches		# Rows	2

Min. Characteristic Resistance Force -43.75 lbf Verify with TAS-105 Tests

Fastener Spacing {(MCRF/P_i) x 144}/Row Spacing

No. of Rows of Fasteners	3	4	5	6
Field Fastener Spacing	14.02	18.70	23.37	28.05
Perimeter Fastener Spacing	8.36	11.14	13.93	16.72
Corner Fastener Spacing	5.55	7.40	9.26	11.11

RECOMMENDED BASE SHEET ATTACHMENT PATTERN

Field	1 row in the laps at 9 inches o.c.	2 rows in the center of the sheet at 9" o.c.
Perimeter	1 row in the laps at 8 inches o.c.	2 rows in the center of the sheet at 8" o.c.
Corner	1 row in the laps at 7 inches o.c.	3 rows in the center of the sheet at 7" o.c.

These calculations have been done in accordance with ASCE 7-10, based on the information provided by the contractor. The roof system must be installed in accordance with the FBC & manufacturer's recommendations. We recommend TAS-105 Tests to verify that above MCRF may be realized, before installing new roof.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

Quest Engineering Services & Testing, Inc. (CA # 7954), 2737 NW 19 St., Pompano Beach, FL-33069 Ph (954) 582 9800 Fax (954) 582 9836

DRAINAGE EVALUATION

Project Name Americana Warehouse Building
Project Address 123 Washington Avenue
Anytown, FL - 33000

Report No.: J-17284.005

The following values are from the Florida Building Code (2010), Plumbing Code, for a 5" per hour rainfall rate

Vertical Leaders	Pipe Ø	2"	3"	4"	5"	6"	8"	
Table 1106.2(1)	Roof Area	575	1760	3680	6920	10800	23200	
Horizontal Piping	Pipe Ø		3"	4"	5"	6"	8"	10"
Table 1106.3	Roof Area		657	1504	2672	4280	9200	16580
Table 1106.7	Length	4"	6"	8"	12"	16"	20"	24"
Weirs (4" Head)	Roof Area	1794	2692	3589	5384	7179	8974	10769
Weirs (3" Head)	Roof Area	1153	1730	2307	3461	4615	5769	6923

ROOF DETAILS

Mean Roof Height 16.0 Feet
Slope V 1/8" : 12

Roof Area (Approx.) 10000 Sq.Ft.
Tributary Roofs 0 Sq.Ft.

		Length (ft)	Height (ft)
Side Walls	1	0	0
	2	0	0
	3	0	0

		Length (ft)	Height (ft)
Parapets	1	434	2
	2	0	0
	3	0	0

Effective Roof Area for Drainage purposes 10434 ft^2

PRIMARY	VERTICAL DRAINS Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1	3.50	9.62	5	11975
Type 2				
Type 3				

THROUGH-WALL SCUPPERS (WEIRS)	Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

SECONDARY	VERTICAL Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

THROUGH-WALL SCUPPERS (WEIRS)	Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1	4	12.00	4	13844
Type 2				
Type 3				

Total Primary Drain Capacity of Existing Drains 11975 ft^2 Adequate

Total Secondary Drain Capacity of Existing Scuppers 13844 ft^2 Adequate

These calculations have been done in accordance with FBC (2017), based on the information provided by the contractor. Position drainage elements such that no more than 5" of ponding occurs anywhere on roof at any time.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786)315-2590 F (786) 31525-99
www.miamidade.gov/economy

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

NOTICE OF ACCEPTANCE (NOA)

CertainTeed Corporation
20 Moores Road
Malvern, PA 19355

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: CertainTeed Modified Bitumen Roof System over Poured Gypsum Decks.

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA renews NOA #14-0529.06 and consists of pages 1 through 25.
The submitted documentation was reviewed by Alex Tigera.

MIAMI-DADE COUNTY APPROVED

NOA No.: 17-1003.08
Expiration Date: 04/28/23
Approval Date: 04/19/18
Page 1 of 25

ROOFING SYSTEM APPROVAL

Category: Roofing
Sub-Category: Modified
Material: APP, SBS
Deck Type: Poured Gypsum
Maximum Design Pressure: **-67.5 psf**

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
All Weather/Empire Base Sheet	39 3/8" x 65'10"; Roll weight: 70 lbs. (2 squares)	ASTM D 4601 Type II UL Type G2	Asphalt coated, fiberglass reinforced base sheet.
Flexiglas Base Sheet	39 3/8" x 98'9"; Roll weight: 90 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Modified Bitumen coated fiberglass base sheet.
Flintlastic Base 20	39 3/8" x 49'6"; Roll weight: 90 lbs. (1.5 squares)	ASTM D 6163, Grade S, Type I	Modified Bitumen coated fiberglass base sheet.
Flintglas Ply Sheet Type IV	39 3/8" x 164'7"; Roll weight: 38 lbs. (5 squares)	ASTM D 2178 Type IV UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintglas Premium Ply Sheet Type VI	39 3/8" x 164'7"; Roll weight: 40 lbs. (5 squares)	ASTM D 2178 Type VI UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintlastic STA	39 3/8" x 32'10"; Roll weight: 87 lbs. (1 square)	ASTM D 6222, Grade S, Type II	Smooth surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA-FR	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GMS	39 3/8" x 32' 10"; Roll weight: 94 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic Premium FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic FR Dual Cap	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6162, Grade G, Type I	Granule surfaced SBS modified bitumen membrane with a nonwoven polyester/fiberglass composite mat reinforcement for use in cold or mop applications.
Flintlastic FR Cap 30	39 3/8" x 32' 10"; Roll weight: 86 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications.
Flintlastic FR Cap 30 T	39 3/8" x 32''10"; Roll weight: 100 lbs. (1 square)	ASTM D6163, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for torch application.
Flintlastic Base 20 T	39 3/8" x 33'; Roll Weight: 81 lbs. (1 square)	ASTM D6163, Grade S, Type I	Modified Bitumen, coated fiberglass base sheet for torch application.
Flintlastic FR Cap 30 CoolStar	39 3/8" x 32' 10"; Roll weight: 88 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic FR Cap 30 T CoolStar	39 3/8" x 32' 10"; Roll weight: 102 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic GTA CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic GTA-FR CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.
Flintlastic GMS CoolStar	39 3/8" x 32' 10"; Roll weight: 97 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Premium FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Ultra Poly SMS Base Sheet	39 3/8" x 32' 10"; Roll weight: 90 lbs. (1 square)	ASTM D 6164, Grade S, Type I	Smooth surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop applications.
Glasbase Base Sheet	39 3/8" x 98'9"; Roll weight: 75 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Asphalt coated, fiberglass base sheet.
Flintlastic Poly SMS Base Sheet	39 3/8" x 64' 3"; Roll weight: 90 lbs. (2 squares)	ASTM D 4601, Grade S, Type II UL Type G2	Modified Bitumen coated polyester base sheet.
Yosemite Venting Base Sheet	39 3/8" x 32'10"; Roll weight: 85 lbs. (1 square)	ASTM D 3909 ASTM D 4897, Type II UL Type G3	Mineral Surfaced fiberglass reinforced buffer sheet.
Flintlastic APP Base T	39 3/8" x 65' 4"; Roll weight: 100 lbs. (2 squares)	ASTM D6509	Modified Bitumen coated fiberglass base sheet.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic Ultra Glass SA	39 3/8" x 33'11"; Roll weight: 73 lbs. (1 square)	ASTM D1970	Self-adhering, fiberglass reinforced, SBS modified bitumen base/ply sheet.
Black Diamond™ Base Sheet	36" x 68'7"; Roll weight: 78 lbs. (2 squares)	ASTM D 1970	Self-adhering fiberglass reinforced modified bitumen base sheet

APPROVED INSULATIONS:

TABLE 2

Product Name	Product Description	Manufacturer (With Current NOA)
FlintBoard ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
FlintBoard ISO Cold	Polyisocyanurate foam insulation	CertainTeed Corp.
$FlintBoard_H$ ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
$FlintBoard_H$ ISO Cold	Polyisocyanurate foam insulation	CertainTeed Corp.
ACFoam-II	Polyisocyanurate foam insulation	Atlas Roofing Corporation
ACFoam-III	Polyisocyanurate foam insulation	Atlas Roofing Corporation
ISO 95+ GL	Polyisocyanurate foam insulation	Firestone Building Products Co.
Stuctodek High Density Fiberboard Roof Insulation	Wood fiber insulation board	Blue Ridge Fiberboard, Inc.
H-Shield, H-Shield CG	Polyisocyanurate foam insulation	Hunter Panels LLC
DensDeck	Water resistant gypsum board	Georgia Pacific Gypsum LLC
DensDeck Prime	Water resistant gypsum board	Georgia Pacific Gypsum LLC
ENRGY 3	Polyisocyanurate foam / wood fiberboard composite insulation	Johns Manville Corp.
ENRGY 3 25 PSI	Polyisocyanurate foam / wood fiberboard composite insulation	Johns Manville Corp.
Ultra-Max	Polyisocyanurate roof insulation	RMax Operating, LLC
Multi-Max FA-3	Polyisocyanurate roof insulation	RMax Operating, LLC
FescoBoard	Expanded mineral fiber insulation	Johns Manville Corp.
SECUROCK Gypsum-Fiber Roof Board	Gypsum insulation	United States Gypsum Corp.

APPROVED FASTENERS:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
1.	Trufast FM-90 Base Sheet Fastener	Base ply fastening systems for lightweight concrete decks.	2.7" x 1.7"	Altenloh, Brinck & Co. U.S., Inc.
2.	Trufast Twin Loc-Nail Assembled Fastener	Galvanized stress plate and tube with integrated locking staple	2.7" round x various lengths	Altenloh, Brinck & Co. U.S., Inc.

APPROVED SURFACING/COATING OPTIONS:

TABLE 4

Chosen components must be applied according to manufacturer's application instructions. Any coating, listed below, used as a surfacing, must be listed within a current NOA.

System Number	Manufacturer	Application
1.	Generic	Gravel applied at 400 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
2.	Generic	Slag applied at 300 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
3.	Karnak Corp.	Karnak (#97 AF) Fibrated Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
4.	CertainTeed Corp.	FlintCoat A-150 applied at an application rate of 1.5 gal/sq.
5.	Gardner Asphalt Corp.	APOC #212 Fibered Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
6.	Gardner Asphalt Corp.	APOC #400 Sunbrite applied at an application rate of 3 gal./sq.

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
Factory Mutual Research Corp.	FM 4470	3Y8A1.AM	03/23/96
	FM 4470	0D3A3.AM	04/04/97
	FM 4470	2D0A0.AM	12/23/98
	FM 4470	1D7A4.AM	11/09/98
	FM 4470	3039046	06/15/10
	FM 4470	3048520	09/19/13
Underwriters Laboratories, Inc.	UL 790	R11656	01/11/13
United States Testing Company	ASTM D 5147	97-457-2R	12/02/87
	ASTM D 5147	97457-4	06/03/88
Momentum Technologies, Inc.	ASTM D6164	AX31G8F	06/05/09
Trinity|ERD	TAS 114(J)	#3504.06.01-1	06/05/01
	TAS 114	3533.01.06	01/06/06
	TAS 114 (H)	Letter	04/05/06
	TAS 117 (B)	3503.10.06	10/10/06
	TAS 117 (B)	O6490.04.07-R1	06/27/07
	TAS 114	3521.07.04-R1	10/26/07
	TAS 117 (B)/ ASTM D 6862	C8500SC.11.07	11/30/07
	TAS 114	C8370.08.08	08/19/08
	TAS 117 & TAS 114	C30560.03.10	03/18/10
	ASTM Physical Properties	C10080.09.08-R4	03/25/10
	ASTM D6164/D4798	C31410.01.11-2	01/10/11
	TAS 117 B	C35500.02.11	02/09/11
	ASTM D1876	C35460.05.11	06/16/11
	ASTM D4601	C40050.09.12-1	09/28/12
	ASTM D1876, TAS 114 (H), TAS 117 (B)	C42110.08.12	08/13/12
	ASTM D1970	C40050.09.12-2	09/28/12
	ASTM D5147/D4798	C31410.10.10-R1	11/01/12
	ASTM D5147/D4798	C31410.01.11-1-R1	11/01/12
	ASTM D4798	C31410.01.11-2A-R1	02/21/13
	ASTM D4798	C31410.12.13	12/05/13
	ASTM D6222	C40050.12.13	12/05/13
	ASTM D1876, TAS 114 (H), FM 4474	C47320.03.14-R1	04/01/15
	ASTM D4601-04 (2012), Type II	CTR-SC11145.09.16-3A	09/19/16
PRI Construction Materials Technologies LLC	ASTM D6163	CTC-066-02-01	08/09/11
	ASTM D6222	CTC-070-02-01	08/09/11
	ASTM D6164/D4798	CTC-093-02-01	08/09/11
	ASTMD 4601	CTC-126-02-01	03/12/12
	ASTM D2178	CTC-122-02-01	03/13/12
	ASTM D4601	CTC-127-02-01	03/13/12

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
	ASTM D6509	CTC-116-02-01	04/04/12
	ASTM D6163	CTC-128-02-01	06/11/12
	ASTM D6163	CTC-129-02-01	06/11/12
	ASTM D6164	CTC-132-02-01	06/11/12
	ASTM D6164	CTC-161-02-01	05/09/13
	ASTM D6162	CTC-183-02-01	10/02/13
	ASTM D6164	CTC-190-02-01	12/02/13
	ASTM D1970	CTC-199-02-01	01/22/14
	ASTM D6222	CTC-071-02-01	08/08/11
	ASTM D6163	CTC-319-02-01	08/22/17

Membrane Type: SBS Modified

Deck Type 6I: Poured Gypsum, Non-Insulated

Deck Description: Poured Gypsum Concrete

System Type E(4): Base sheet mechanically fastened.

All General and System limitations apply.

Base Sheet: One ply of All Weather/Empire Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet or Yosemite Venting Base Sheet mechanically fastened to the deck as detailed below:

Fastening #1: Trufast Twin Loc-Nail Assembled Fasteners spaced 7" o.c. in 4" side lap and two staggered rows in center of the sheet, 7" o.c.
(Maximum Design Pressure –67.5 psf, See General Limitation #9.)

Fastening #2: Trufast Twin Loc-Nail Assembled Fasteners spaced 9" o.c. in 4" side lap and two staggered rows in center of the sheet, 9" o.c.
(Maximum Design Pressure –60 psf, See General Limitation #9.)

Ply Sheet: (Optional) One ply of All Weather/Empire Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet or one or more plies of Flintglas Ply Sheet Type IV or Flintglas Premium Ply Sheet Type VI adhered to the base sheet in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or Flintlastic Ultra Poly SMS Base Sheet torch applied or one ply of Black Diamond Base Sheet or Flintlastic Ultra Glass SA self-adhered.

Membrane: One ply of Flintlastic GMS, Flintlastic GMS CoolStar, Flintlastic FR Dual Cap, Flintlastic FR-P, Flintlastic FR-P CoolStar, Flintlastic FR Cap 30, Flintlastic FR Cap 30 CoolStar applied to the base sheet or ply sheet in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or Flintlastic FR Cap 30 T or Flintlastic FR Cap 30 T CoolStar torch adhered to base or ply sheet.

Surfacing: (Optional) Any of the approved surfacing/coating options listed in Table 4.

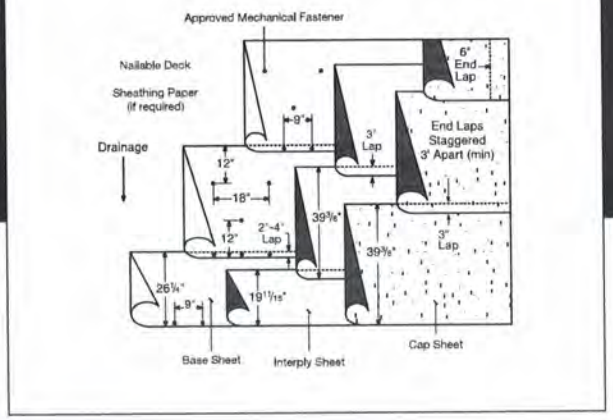
Maximum Design Pressure: See fastening requirements above

GENERAL LIMITATIONS:

1. Fire classification is not part of this acceptance; refer to a current Approved Roofing Materials Directory for fire ratings of this product.
2. Insulation may be installed in multiple layers. The first layer shall be attached in compliance with Product Control Approval guidelines. All other layers shall be adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq., or mechanically attached using the fastening pattern of the top layer
3. All standard panel sizes are acceptable for mechanical attachment. When applied in approved asphalt, panel size shall be 4' x 4' maximum.
4. An overlay and/or recovery board insulation panel is required on all applications over closed cell foam insulations when the base sheet is fully mopped. If no recovery board is used the base sheet shall be applied using spot mopping with approved asphalt, 12" diameter circles, 24" o.c.; or strip mopped 8" ribbons in three rows, one at each side lap and one down the center of the sheet allowing a continuous area of ventilation. Encircling of the strips is not acceptable. A 6" break shall be placed every 12' in each ribbon to allow cross ventilation. Asphalt application of either system shall be at a minimum rate of 12 lbs./sq.
   Note: Spot attached systems shall be limited to a maximum design pressure of -45 psf.
5. Fastener spacing for insulation attachment is based on a Minimum Characteristic Force (F') value of 275 lbf., as tested in compliance with Testing Application Standard TAS 105. If the fastener value, as field-tested, are below 275 lbf. insulation attachment shall not be acceptable.
6. Fastener spacing for mechanical attachment of anchor/base sheet or membrane attachment is based on a minimum fastener resistance value in conjunction with the maximum design value listed within a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing, prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standards TAS 105 and calculations in compliance with Roofing Application Standard RAS 117.
7. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased for both insulation and base sheet as calculated in compliance with Roofing Application Standard RAS 117. Calculations prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant **(When this limitation is specifically referred within this NOA, General Limitation #9 will not be applicable.)**
8. All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform to Roofing Application Standard RAS 111 and applicable wind load requirements.
9. The maximum designed pressure limitation listed shall be applicable to all roof pressure zones (i.e. field, perimeters, and corners). Neither rational analysis, nor extrapolation shall be permitted for enhanced fastening at enhanced pressure zones (i.e. perimeters, extended corners and corners). **(When this limitation is specifically referred within this NOA, General Limitation #7 will not be applicable.)**
10. All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

END OF THIS ACCEPTANCE

SBS-N-3-A



Base sheet, one interply sheet and an SBS modified cap sheet

SUBSTRATE:
- Nailable (mechanically attached, Sec. 3.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
Approved base sheet, mechanically attached to approved substrate (Sec. 15.0).

Approved interply sheet set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- Base sheet (1 ply)
- Interply sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if interply is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED INTERPLY SHEETS:
(one of the following)
- All Weather/ Empire Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas Base Sheet
- Flintlastic Base 20
- Flintglas® Ply 4
- Flintglas Premium Ply 6
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

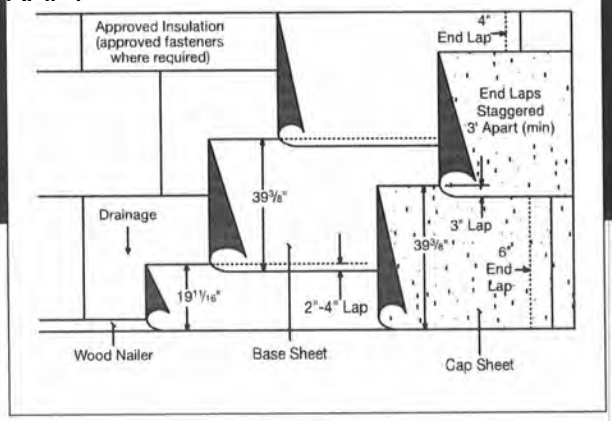
WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed SAINT-GOBAIN
Commercial Roofing

SBS-I-2-A



Insulated substrates: base sheet and an SBS modified cap sheet

SUBSTRATE:
- Steel and nailable (mechanically attached, Sec. 15.4)
- Non-nailable (adhered, Sec. 4.0)
- Insulation (Sec. 4.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
One or more layers of approved insulation and/or coverboard:
- Base layer mechanically attached and additional layers mechanically attached or adhered in hot asphalt or approved adhesive.
- Base layer and additional layers adhered in hot asphalt or approved adhesive.
- Vapor retarder/anchor sheets (Sec. 4.7).

Approved base sheet, set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- One or more layers of insulation and/ or coverboard
- Base sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if base sheet is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed SAINT-GOBAIN
Commercial Roofing

APPENDIX E

MODIFIED BITUMEN ROOF SYSTEM OVER TECTUM DECK PROTOCOL

BID PACKAGE

for

RE-ROOF INSTALLATION (Tectum)

at

AMERICANA WAREHOUSE BUILDING
123 WASHINGTON AVENUE
ANYTOWN, FL - 33000

Prepared for

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

May 8, 2018

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INTRODUCTION

The subject property comprises of a warehouse building that was built in 1974. This 1-story warehouse building has a flat roof with a cementitious wood fiber deck. The main flat roof is at an elevation of about 16 feet. The total roof area is approximately 10,000 sf. The main roof has a Modified Bitumen roof system over the cementitious wood fiber deck. This specification addresses the removal of the existing roof down to the cementitious wood fiber (Tectum) deck and the installation of a new CertainTeed Modified Bitumen roof system.

Quest Engineering Services & Testing, Inc. (QuEST) has prepared the following bid package for the new roof installation at the subject site. The new roof proposed is a CertainTeed Modified Bitumen SBS Roof System over Cementitious Wood Fiber Decks. This roof system's Miami-Dade Notice of Acceptance No. is 17-1003.06 (Page 16 of 17, System Design Pressure -60 psf with Limitation #7). This system comprises of a mechanically attached Flexiglas Base Sheet, hot-mopped Flintlastic Poly SMS Ply Sheet and a hot-mopped Flintlastic GMS Cap Sheet.

SCOPE OF PROJECT

The scope of this project is to remove the existing roof down to the cementitious wood fiber deck, inspect, clean (and repair if necessary) the existing roof deck and then install the new roof system in accordance with the Florida Building Code (2017). Prior to commencement of the re-roofing contractor shall verify existing cementitious wood fiber deck condition and joist anchoring. Damaged deck areas will need to be repaired and/or replaced. As a part of the new roof installation, the membrane should be draped up and over the parapet walls and a new coping cap installed. The owner reserves the right to request post-installation bell chamber tests (TAS-124) to assure that roof system has been installed in an acceptable manner. Failing areas will need to be repaired and retested at contractor's expense, before acceptance.

As this project's aim is to generate a reliable bid as it pertains to deck diaphragm improvements required by the new Florida Building Code (2017) associated with re-roofing on old buildings that were designed with wind codes pre-dating ASCE 7-88, we have eliminated work associated with RTUs and/or its upgrades. The contractor must install CertainTeed and FBC approved flashing around all roof penetrations and equipment curbs.

For purposes of this research project, we have assumed that the cementitious wood fiber (tectum) deck is sloped adequately to provide positive drainage. As indicated in the attached drainage evaluation, the existing primary drains and emergency overflow scuppers are adequate. Ensure that these scuppers are positioned such that their bottoms are not less than 2" or more than 4" above roof level. Care should be taken to ensure that ponding water in excess of 5" does not occur at any time at any portion of the roof.

The information provided in these specifications is for general informational purposes only. The contractor is responsible for obtaining a re-roofing permit and coordinating with the Building Department for all necessary in-progress and final inspections. All testing and engineering necessary to obtain a permit and complete this job are the also the contractor's responsibility.

The roof contractor must be certified by CertainTeed Corp to install this roof system. The contractor must provide a 20-year NDL warranty on labor and materials. All work should be done in accordance with the Florida Building Code (2017), including applicable HVHZ protocols. All installation, product and safety guidelines of the roof system manufacturer, along with OSHA mandated safety guidelines should be followed. In case of conflicts, the more stringent standard should be followed.

Safety and Clean-Up

The contractor, its employees, representatives, agents and sub-contractors should observe all safety precautions as required by OSHA during the entire duration of this project. The contractor should also clean-up on a daily basis. This is an occupied facility and contractor must maintain the site in a presentable fashion at all times.

Insurance Requirements

The roofing contractor must maintain all necessary licenses and insurance certificates throughout the duration of the job.

Mail Sealed Bids:

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

Ph (352) 222 6147 Fax (561) 245 4447

Deadline: Bid Packages must be received by **5:00 PM on May 15, 2018.**

All technical questions concerning this bid package may be addressed directly to Quest Engineering Services & Testing, Inc. If there are any technical questions, please contact:

R. N. Sailappan, P.E., *Quest Engineering Services & Testing, Inc.*, **Ph (954) 582 9800**

REROOFING SPECIFICATIONS

This section outlines the general guidelines for the bidding and reproofing at the subject site. The guidelines under the general sub-section apply to the entire project.

General

1. Only those bidders on the invited bidders list are eligible to bid on this project.

2. All bidders must be licensed in the State of Florida and have a minimum of 5 years of experience providing such services.

3. The bid should also identify the bidder's contact person and contact information.

4. All bidders should maintain appropriate licenses and insurance requirements during the entire project duration. The liability insurance policy should name AMPCO as additional insured. The minimum insurance requirements are as follow:

Workman's Compensation	-	Statutory Limits
General Liability & Property Damage	-	$1,000,000.00

5. The bid packages should include the following:

   a) Bidder's Contact Information
   b) Filled out Bid Form with Cost Proposal for Roof Replacement with breakdowns for all 3 facets, namely:

      Deck testing to verify adequacy of tectum deck to receive new roof
      Enhance Edge Connections to satisfy new diaphragm shear enhancements
      Deck Replacement to satisfy new diaphragm shear enhancements

REQUIRED SUBMITTALS BY SELECTED CONTRACTOR

A. Prior to starting work, the roofing contractor must submit the following:

1. Shop drawings showing layout, details of construction and identification of materials.

2. A sample of the manufacturer's Membrane System Warranty.

3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.

4. Certification of the manufacturer's warranty reserve.

B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

BID FORM

Contractor:

Date till which Price is Valid:

Cost Proposal:

1. Base Bid for Roof Replacement $ _____
2. Fee for Fastener Withdrawal Tests (TAS-105) $ _____
   Cut, test and patch all test locations
3. Fee for Investigating Deck Edge Attachment $ _____
   Cut and expose Drywall/drop-down ceiling along roof perimeter
   to verify deck edge fastening and Joist anchoring
4. Additional Cost for Enhanced Edge and Support Connections $ _____
   434 linear feet of perimeter; 124 Joist Bearing Points
   Install 3" x 3" x ¼" deck ledger angle all along roof deck perimeter
   secured to wall with Ø ½" expansion anchor bolts at 24" o.c.
   (bolts to have minimum 4" embedment into filled cell of wall) and
   to each joist with two Ø 3/8" bolts and nuts.
5. Unit Cost for Partial Deck Replacement $ _____
   Removal of damaged cementitious wood fiber deck and its disposal
   Grinding of welds/removal of tectum panel clips/runners
   Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B'
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)
   Install ISO insulation to match Tectum Deck thickness
6. Additional Cost for Full Deck Replacement $ _____
   Removal of cementitious wood fiber deck and its disposal
   Grinding of welds/removal of tectum panel clips/runners
   Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B'
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)
   Install 1.5" thick ISO insulation
7. Associated Engineering Cost $ _____

All work will be done by licensed personnel after obtaining relevant permits, in accordance with the Florida Building Code (2017)

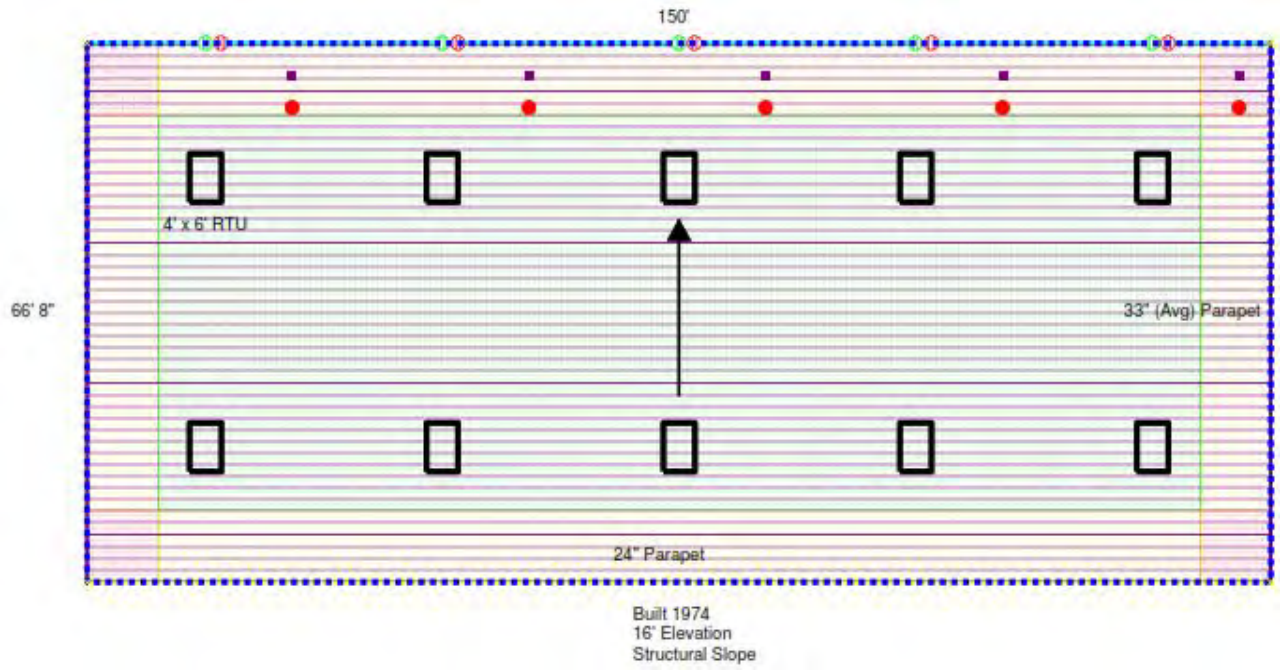
Bid acknowledged and submitted by:

Signature: _____

Name: _____

Firm Name: _____

Date: _____



Cementitious Wood Fiber (Tectum) Deck

Legend	Pitch	Description
	<none>	Perimeter
	0.25/12	Remove Mod Bit
	0.25/12	Glass Base Nld (Tectum)
	0.25/12	Glass Base Nld (Tectum)
	0.25/12	Glass Base Nld (Tectum)
	0.25/12	Mod Bit, Ply Bs, GMS (Bs Sht)
	0.25/12	Cricket,1/2" Slope, 2x4, 2 bds,
	<none>	1/2 Sht Flsh & Cant @ Curbs
	<none>	Flsh & Cant (ms) 24" HIgh Wall
	<none>	Flsh & Cant (ms) 33" (Avg) HIgh Wall
	<none>	Flsh & Cant (ms) 41" HIgh Wall
	0.25/12	VTR Flashing w/ 3" Lead Boot
	0.25/12	Vent 10" GRV
	0.25/12	Scupper,Through Wall
	0.25/12	Scupper,Overflow Through Wall
	<none>	Coping Cap @ Parapet
	0.25/12	Coping Miter

QuEST

Quest Engineering Services & Testing, Inc.
2737 NW 19th Street
Pompano Beach, FL – 33069

Ph (954) 582 9800 **Fax (954) 582 9836**

Title:	**ROOF PLAN**
Project:	**Americana Building** **123 Washington Avenue** **Anytown, FL - 30000**
Client:	**UF College of Design, Construction & Planning**

Dimensions indicated are approximate. Contractor must field verify before bidding.

Scale: NTS

Project No.	Drawn	Sheet No.	Revision No.	Revision Date
J-17284	**RNS**	**1 of 1**		

BASE SHEET ATTACHMENT CALCULATIONS

Project Name Americana Warehouse Building **Report No.:** J-17284.006
Project Address 123 Washington Avenue
Anytown, FL - 30000

Deck Substrate	Cementitious Wood Fiber (Tectum)	Mean Roof Height	16.0 Feet
Configuration	Low Slope	Roof Area (Approx.)	10000 Sq.Ft.
Category	II	Roof Width	66.7 Feet
Exposure Condition	C	Perimeter Width	6.4 Feet
Building Type	Enclosed	Parapet Height	2.0 Feet
Base Wind Speed	170 mph	Corner Zones	6.4' x 6.4' Each

Slope V 0.0 Slope H 12.0 Slope Angle° 0.00

Uplift Pressures $q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2$ $P = q_z\ (GC_p - GC_{pi})$

q_z	K_z	K_{zt}	K_d	V	GC_p	GC_{pi}	
54.384	0.860	1.005	0.85	170	-1.00	0.18	Field
					-1.80	0.18	Perimeter
					-2.80	0.18	Corner

Field	$P_{1\ ult.}$	-64.17 psf	$P_{1\ asd}$	-38.50 psf	
Perimeter	$P_{2\ ult.}$	-107.68 psf	$P_{2\ asd}$	-64.61 psf	
Corner	$P_{3\ ult.}$	-162.06 psf	$P_{3\ asd}$	-97.24 psf	

Proposed System CertainTeed Modified Bitumen Roof System over Cementitions Wood Fiber Deck
Product Approval No. 17-1003.06 (Page 16 of 17) Fastening #2
System Design Pressure -60 psf

Fasteners Trufast Twin Loc-Nail Assembled Fasteners

Base Sheet Width 39 inches Side Lap 4 inches Net Width 35 inches

Fastener Spacing in	Lap of Base Sheet	9 inches	# Rows	1
Fastener Spacing in	Field of Base Sheet	9 inches	# Rows	2

Min. Characteristic Resistance Force -43.75 lbf Verify with TAS-105 Tests

Fastener Spacing {(MCRF/P_i) x 144}/Row Spacing

No. of Rows of Fasteners	3	4	5	6
Field Fastener Spacing	14.02	18.70	23.37	28.05
Perimeter Fastener Spacing	8.36	11.14	13.93	16.72
Corner Fastener Spacing	5.55	7.40	9.26	11.11

RECOMMENDED BASE SHEET ATTACHMENT PATTERN

Field	1 row in the laps at 9 inches o.c.	2 rows in the center of the sheet at 9" o.c.
Perimeter	1 row in the laps at 8 inches o.c.	2 rows in the center of the sheet at 8" o.c.
Corner	1 row in the laps at 7 inches o.c.	3 rows in the center of the sheet at 7" o.c.

These calculations have been done in accordance with ASCE 7-10, based on the information provided by the contractor. The roof system must be installed in accordance with the FBC & manufacturer's recommendations. We recommend TAS-105 Tests to verify that above MCRF may be realized, before installing new roof.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

Quest Engineering Services & Testing, Inc. (CA # 7954), 2737 NW 19 St., Pompano Beach, FL-33069 Ph (954) 582 9800 Fax (954) 582 9836

DRAINAGE EVALUATION

Project Name Americana Warehouse Building
Project Address 123 Washington Avenue
Anytown, FL - 33000

Report No.: J-17284.006

The following values are from the Florida Building Code (2010), Plumbing Code, for a 5" per hour rainfall rate

Vertical Leaders	Pipe Ø	2"	3"	4"	5"	6"	8"	
Table 1106.2(1)	Roof Area	575	1760	3680	6920	10800	23200	
Horizontal Piping	Pipe Ø		3"	4"	5"	6"	8"	10"
Table 1106.3	Roof Area		657	1504	2672	4280	9200	16580
Table 1106.7	Length	4"	6"	8"	12"	16"	20"	24"
Weirs (4" Head)	Roof Area	1794	2692	3589	5384	7179	8974	10769
Weirs (3" Head)	Roof Area	1153	1730	2307	3461	4615	5769	6923

ROOF DETAILS

Mean Roof Height 16.0 Feet
Slope V 1/8" : 12

Roof Area (Approx.) 10000 Sq.Ft.
Tributary Roofs 0 Sq.Ft.

		Length (ft)	Height (ft)
Side Walls	1	0	0
	2	0	0
	3	0	0

		Length (ft)	Height (ft)
Parapets	1	434	2
	2	0	0
	3	0	0

Effective Roof Area for Drainage purposes 10434 ft^2

PRIMARY	VERTICAL DRAINS Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1	3.50	9.62	5	11975
Type 2				
Type 3				

	THROUGH-WALL SCUPPERS (WEIRS) Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

SECONDARY	VERTICAL Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

	THROUGH-WALL SCUPPERS (WEIRS) Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1	4	12.00	4	13844
Type 2				
Type 3				

Total Primary Drain Capacity of Existing Drains 11975 ft^2 Adequate

Total Secondary Drain Capacity of Existing Scuppers 13844 ft^2 Adequate

These calculations have been done in accordance with FBC (2017), based on the information provided by the contractor. Position drainage elements such that no more than 5" of ponding occurs anywhere on roof at any time.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786)315-2590 F (786) 31525-99
www.miamidade.gov/economy

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

NOTICE OF ACCEPTANCE (NOA)

CertainTeed Corporation
20 Moores Road
Malvern, PA 19355

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: CertainTeed Modified Bitumen Roofing Systems over Cementitious Wood Fiber Decks.

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA renews NOA No.14-0529.04 and consists of pages 1 through 17.
The submitted documentation was reviewed by Alex Tigera.

MIAMI-DADE COUNTY APPROVED

NOA No.: 17-1003.06
Expiration Date: 06/19/23
Approval Date: 04/19/18
Page 1 of 17

ROOFING SYSTEM APPROVAL

Category: Roofing
Sub-Category: Modified Bitumen
Material: APP/SBS
Deck Type: Wood
Maximum Design Pressure: **-67.5 psf.**

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
All Weather/Empire Base Sheet	39 3/8" x 65'10"; Roll weight: 70 lbs. (2 squares)	ASTM D 4601 Type II UL Type G2	Asphalt coated, fiberglass reinforced base sheet.
Flexiglas Base Sheet	39 3/8" x 98'9"; Roll weight: 90 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Modified Bitumen coated fiberglass base sheet.
Flintlastic Base 20	39 3/8" x 49' 6"; Roll weight: 90 lbs. (1.5 squares)	ASTM D 6163, Grade S, Type I	Modified Bitumen coated fiberglass base sheet.
Flintglas Ply Sheet Type IV	39 3/8" x 164'7"; Roll weight: 38 lbs. (5 squares)	ASTM D 2178 Type IV UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintglas Premium Ply Sheet Type VI	39 3/8" x 164'7"; Roll weight: 40 lbs. (5 squares)	ASTM D 2178 Type VI UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintlastic STA	39 3/8" x 32' 10"; Roll weight: 87 lbs. (1 square)	ASTM D 6222, Grade S, Type I	Smooth surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA-FR	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GMS	39 3/8" x 32' 10"; Roll weight: 94 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic Premium FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic FR Dual Cap	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6162, Grade G, Type I	Granule surfaced SBS modified bitumen membrane with a nonwoven polyester/fiberglass composite mat reinforcement for use in cold or mop applications.
Flintlastic FR Cap 30	39 3/8" x 32' 10"; Roll weight: 86 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications.
Flintlastic FR Cap 30 T	39 3/8" x 32' 10"; Roll weight: 100 lbs. (1 square)	ASTM D6163, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for torch application.
Flintlastic Base 20 T	39 3/8" x 33'; Roll Weight: 81 lbs. (1 square)	ASTM D6163, Grade S, Type I	Modified Bitumen, coated fiberglass base sheet for torch application.
Flintlastic FR Cap 30 CoolStar	39 3/8" x 32' 10"; Roll weight: 88 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic FR Cap 30 T CoolStar	39 3/8" x 32' 10"; Roll weight: 102 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic GTA CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic GTA-FR CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222 Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.
Flintlastic GMS CoolStar	39 3/8" x 32' 10"; Roll weight: 97 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Premium FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164 Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Ultra Poly SMS Base Sheet	39 3/8" x 32' 10"; Roll weight: 90 lbs. (1 squares)	ASTM D 6164, Grade S, Type I	Smooth surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop applications.
Glasbase Base Sheet	39 3/8" x 98'9"; Roll weight: 75 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Asphalt coated, fiberglass base sheet.
Flintlastic Poly SMS Base Sheet	39 3/8" x 64' 3"; Roll weight: 90 lbs. (2 squares)	ASTM D 4601, Grade S, Type II UL Type G2	Modified Bitumen coated polyester base sheet.
Yosemite Venting Base Sheet	39 3/8" x 32'10"; Roll weight: 85 lbs. (1 square)	ASTM D 3909 ASTM D 4897, Type II UL Type G3	Mineral Surfaced fiberglass reinforced buffer sheet.
Flintlastic APP Base T	39 3/8" x 65' 4"; Roll weight: 100 lbs. (2 squares)	ASTM D6509	Modified Bitumen coated fiberglass base sheet.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic Ultra Glass SA	39 3/8" x 33'11"; Roll weight: 73 lbs. (1 square)	ASTM D1970	Self-adhering, fiberglass reinforced, SBS modified bitumen base/ply sheet.
Black Diamond™ Base Sheet	36" x 68'7"; Roll weight: 78 lbs. (2 squares)	ASTM D 1970	Self-adhering fiberglass reinforced modified bitumen base sheet

APPROVED INSULATIONS:

TABLE 2

Product Name	Product Description	Manufacturer (With Current NOA)
FlintBoard ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
FlintBoard$_H$ ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
ACFoam-II	Polyisocyanurate foam insulation	Atlas Roofing Corp.
Structodek High Density Fiberboard Roof Insulation	High Density Wood Fiber insulation board	Blue Ridge Fiberboard, Inc.
DensDeck	Water resistant gypsum board	Georgia Pacific Gypsum LLC
DensDeck Prime	Water resistant gypsum board	Georgia-Pacific Gypsum LLC
H-Shield	Polyisocyanurate foam insulation	Hunter Panels LLC
ENRGY 3	Polyisocyanurate foam insulation	Johns Manville Corp.
ENRGY 3 25 PSI	Polyisocyanurate foam insulation	Johns Manville Corp.
Ultra-Max	Polyisocyanurate roof insulation	RMax Operating, LLC

APPROVED FASTENERS:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
1.	Trufast Twin Loc-Nail Assembled Fastener	Galvanized stress plate and tube with integrated locking staple.	2.7" round x various lengths	Altenloh, Brinck & Co. U.S., Inc.

APPROVED SURFACING/COATING OPTIONS:

TABLE 4

Chosen components must be applied according to manufacturer's application instructions. Any coating, listed below, used as a surfacing, must be listed within a current NOA.

System Number	Manufacturer	Application
1.	Generic	Gravel applied at 400 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
2.	Generic	Slag applied at 300 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
3.	Karnak Corp.	Karnak (#97 AF) Fibrated Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
4.	CertainTeed Corp.	FlintCoat A-150 applied at an application rate of 1.5 gal/sq.
5.	Gardner Asphalt Corp.	APOC #212 Fibered Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
6.	Gardner Asphalt Corp.	APOC #400 Sunbrite applied at an application rate of 3 gal./sq.

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
Factory Mutual Research Corp.	FM 4470	3Y8A1.AM	03/23/96
	FM 4470	0D3A3.AM	04/04/97
	FM 4470	2D0A0.AM	12/23/98
	FM 4470	1D7A4.AM	11/09/98
	FM 4470	3024177	07/18/06
	FM 4470	3039046	06/15/10
	FM 4470	3048520	09/19/13
Underwriters Laboratories, Inc.	UL 790	R11656	01/11/13
United States Testing Company	ASTM D 5147	97-457-2R	12/02/87
	ASTM D 5147	97457-4	06/03/88
Momentum Technologies, Inc.	ASTM D6164	AX31G8F	06/05/09
Trinity|ERD	TAS 114(J)	#3504.06.01-1	06/05/01
	TAS 114	3533.01.06	01/06/06
	TAS 114 (H)	Letter	04/05/06
	TAS 117 (B)	3503.10.06	10/10/06
	TAS 117 (B)	O6490.04.07-R1	06/27/07
	TAS 114	3521.07.04-R1	10/26/07
	TAS 117 (B)/ ASTM D 6862	C8500SC.11.07	11/30/07
	TAS 114	C8370.08.08	08/19/08
	TAS 117 & TAS 114	C30560.03.10	03/18/10
	ASTM Physical Properties	C10080.09.08-R4	03/25/10
	ASTM D4601	C40050.09.12-1	09/28/12

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
	TAS 117 B	C35500.02.11	02/09/11
	ASTM D1876	C35460.05.11	06/16/11
	ASTM D1876, TAS 114 (H), TAS 117 (B)	C42110.08.12	08/13/12
	ASTM D1970	C40050.09.12-2	09/28/12
	ASTM D5147/D4798	C31410.10.10-R1	11/01/12
	ASTM D5147/D4798	C31410.01.11-1-R1	11/01/12
	ASTM D4798	C31410.01.11-2A-R1	02/21/13
	ASTM D4798	C31410.12.13	12/05/13
	ASTM D6222	C40050.12.13-R1	12/31/13
	ASTM D1876, TAS 114 (H), FM 4474	C47320.03.14-R1	04/01/15
	ASTM D4601-04 (2012), Type II	CTR-SC11145.09.16-3A	09/19/16
PRI Construction Materials Technologies LLC	ASTM D6163	CTC-066-02-01	08/09/11
	ASTM D6222	CTC-071-02-01	08/08/11
	ASTM D6222	CTC-070-02-01	08/09/11
	ASTM D6164/D4798	CTC-093-02-01	08/09/11
	ASTM D4601	CTC-126-02-01	03/12/12
	ASTM D2178	CTC-122-02-01	03/13/12
	ASTM D2178	CTC-123-02-01	03/13/12
	ASTM D4601	CTC-127-02-01	03/13/12
	ASTM D6509	CTC-116-02-01	04/04/12
	ASTM D6163	CTC-128-02-01	06/11/12
	ASTM D6163	CTC-129-02-01	06/11/12
	ASTM D6164	CTC-132-02-01	06/11/12
	ASTM D6164	CTC-161-02-01	05/09/13
	ASTM D6162	CTC-183-02-01	10/02/13
	ASTM D6164	CTC-190-02-01	12/02/13
	ASTM D1970	CTC-199-02-01	01/22/14
	ASTM D6163	CTC-319-02-01	08/22/17

Membrane Type: SBS Modified

Deck Type 5I: Cementitious Wood Fiber, Non-Insulated

Deck Description: Cementitious Wood Fiber

System Type E(2): Base sheet mechanically fastened.

All General and System limitations apply.

Base Sheet: One ply of Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, All Weather/Empire Base Sheet, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet or Yosemite Venting Base Sheet mechanically fastened to the deck:

Fastening #1: Trufast Twin Loc-Nail Assembled Fastener spaced 7" o.c. in 4" side lap and two staggered rows in center of the sheet, 7" o.c.
(Maximum Design Pressure –67.5 psf., See General Limitation #9.)

Fastening #2: Trufast Twin Loc-Nail Assembled Fastener spaced 9" o.c. in 4" side lap and two staggered rows in center of the sheet, 9" o.c.
(Maximum Design Pressure –60 psf., See General Limitation #9.)

Ply Sheet: (Optional) One ply of All Weather/Empire Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet or one or more plies of Flintglas Ply Sheet Type IV or Flintglas Premium Ply Sheet Type VI adhered to the base sheet in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or one ply of Black Diamond Base Sheet or Flintlastic Ultra Glass SA self-adhered or Flintlastic Ultra Poly SMS Base Sheet torch applied.

Membrane: One ply of Flintlastic GMS, Flintlastic GMS CoolStar, Flintlastic FR Dual Cap, Flintlastic FR-P, Flintlastic FR-P CoolStar, Flintlastic FR Cap 30, Flintlastic FR Cap 30 CoolStar applied to the base sheet or ply sheet in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or Flintlastic FR Cap 30 T or Flintlastic FR Cap 30 T CoolStar torch adhered to base or ply sheet.

Surfacing: (Optional) Any of the approved surfacing/coating options listed in Table 4.

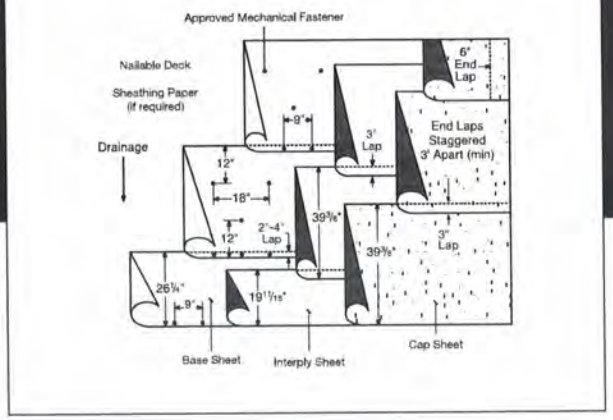
Maximum Design Pressure: See Fastening requirements above.

GENERAL LIMITATIONS:

1. Fire classification is not part of this acceptance; refer to a current Approved Roofing Materials Directory for fire ratings of this product.
2. Insulation may be installed in multiple layers. The first layer shall be attached in compliance with Product Control Approval guidelines. All other layers shall be adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq., or mechanically attached using the fastening pattern of the top layer
3. All standard panel sizes are acceptable for mechanical attachment. When applied in approved asphalt, panel size shall be 4' x 4' maximum.
4. An overlay and/or recovery board insulation panel is required on all applications over closed cell foam insulations when the base sheet is fully mopped. If no recovery board is used the base sheet shall be applied using spot mopping with approved asphalt, 12" diameter circles, 24" o.c.; or strip mopped 8" ribbons in three rows, one at each side lap and one down the center of the sheet allowing a continuous area of ventilation. Encircling of the strips is not acceptable. A 6" break shall be placed every 12' in each ribbon to allow cross ventilation. Asphalt application of either system shall be at a minimum rate of 12 lbs./sq. **Note: Spot attached systems shall be limited to a maximum design pressure of -45 psf.**
5. Fastener spacing for insulation attachment is based on a Minimum Characteristic Force (F') value of 275 lbf., as tested in compliance with Testing Application Standard TAS 105. If the fastener value, as field-tested, are below 275 lbf. insulation attachment shall not be acceptable.
6. Fastener spacing for mechanical attachment of anchor/base sheet or membrane attachment is based on a minimum fastener resistance value in conjunction with the maximum design value listed within a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing, prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standards TAS 105 and calculations in compliance with Roofing Application Standard RAS 117.
7. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased for both insulation and base sheet as calculated in compliance with Roofing Application Standard RAS 117. Calculations prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant **(When this limitation is specifically referred within this NOA, General Limitation #9 will not be applicable.)**
8. All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform to Roofing Application Standard RAS 111 and applicable wind load requirements.
9. The maximum designed pressure limitation listed shall be applicable to all roof pressure zones (i.e. field, perimeters, and corners). Neither rational analysis, nor extrapolation shall be permitted for enhanced fastening at enhanced pressure zones (i.e. perimeters, extended corners and corners). **(When this limitation is specifically referred within this NOA, General Limitation #7 will not be applicable.)**
10. All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

END OF THIS ACCEPTANCE

SBS-N-3-A



Base sheet, one interply sheet and an SBS modified cap sheet

SUBSTRATE:
- Nailable (mechanically attached, Sec. 3.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
Approved base sheet, mechanically attached to approved substrate (Sec. 15.0).

Approved interply sheet set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- Base sheet (1 ply)
- Interply sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if interply is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED INTERPLY SHEETS:
(one of the following)
- All Weather/ Empire Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas Base Sheet
- Flintlastic Base 20
- Flintglas® Ply 4
- Flintglas Premium Ply 6
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

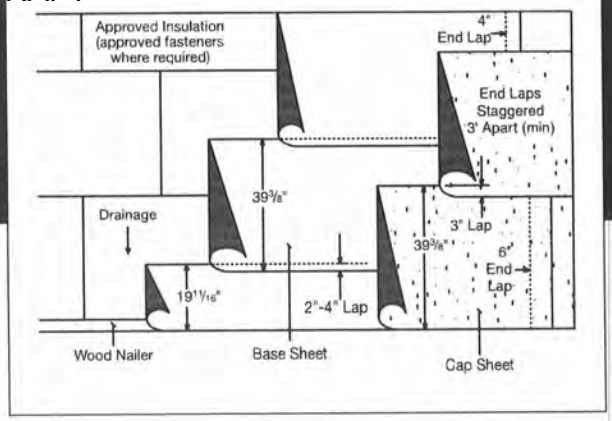
WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed SAINT-GOBAIN
Commercial Roofing

SBS-I-2-A



Insulated substrates: base sheet and an SBS modified cap sheet

SUBSTRATE:
- Steel and nailable (mechanically attached, Sec. 15.4)
- Non-nailable (adhered, Sec. 4.0)
- Insulation (Sec. 4.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
One or more layers of approved insulation and/or coverboard:
- Base layer mechanically attached and additional layers mechanically attached or adhered in hot asphalt or approved adhesive.
- Base layer and additional layers adhered in hot asphalt or approved adhesive.
- Vapor retarder/anchor sheets (Sec. 4.7).

Approved base sheet, set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- One or more layers of insulation and/ or coverboard
- Base sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if base sheet is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

CertainTeed
SAINT-GOBAIN
Commercial Roofing

Consult CertainTeed General Recommendations for noted section references.

APPENDIX F

MODIFIED BITUMEN ROOF SYSTEM OVER LIGHTWEIGHT ENGINEERED COMPOSITE DECK PROTOCOL

BID PACKAGE

for

RE-ROOF INSTALLATION (Composite)

at

AMERICANA WAREHOUSE BUILDING
123 WASHINGTON AVENUE
ANYTOWN, FL - 33000

Prepared for

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

May 9, 2018

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INTRODUCTION

The subject property comprises of a warehouse building that was built in 1974. This 1-story warehouse building has a flat roof with a structural composite deck. The main flat roof is at an elevation of about 16 feet. The total roof area is approximately 10,000 sf. The main roof has a Modified Bitumen roof system over the Lightweight Engineered Composite deck. This specification addresses the removal of the existing roof down to the composite deck and the installation of a new CertainTeed Modified Bitumen roof system.

Quest Engineering Services & Testing, Inc. (QuEST) has prepared the following bid package for the new roof installation at the subject site. The new roof proposed is a CertainTeed Modified Bitumen SBS Roof System. This roof system's Miami-Dade Notice of Acceptance No. is 17-1003.08 (Page 24 of 25, System Design Pressure -60 psf with Limitation #7). This system comprises of a mechanically attached Flexiglas Base Sheet, hot-mopped Flintlastic Poly SMS Ply Sheet and a hot-mopped Flintlastic GMS Cap Sheet.

SCOPE OF PROJECT

The scope of this project is to remove the existing roof down to the composite deck, inspect, clean (and repair if necessary) the existing roof deck and then install the new roof system in accordance with the Florida Building Code (2017). Prior to commencement of the re-roofing contractor shall verify existing composite deck attachment/condition and joist anchoring. Damaged deck areas will need to be repaired and/or replaced. As a part of the new roof installation, the membrane should be draped up and over the parapet walls and a new coping cap installed. The owner reserves the right to request post-installation bell chamber tests (TAS-124) to assure that roof system has been installed in an acceptable manner. Failing areas will need to be repaired and retested at contractor's expense, before acceptance.

As this project's aim is to generate a reliable bid as it pertains to deck diaphragm improvements required by the new Florida Building Code (2017) associated with re-roofing on old buildings that were designed with wind codes pre-dating ASCE 7-88, we have eliminated work associated with RTUs and/or its upgrades. The contractor must install CertainTeed and FBC approved flashing around all roof penetrations and equipment curbs.

For purposes of this research project, the composite deck is assumed to be sloped adequately to achieve positive drainage. As indicated in the attached drainage evaluation, the existing primary drains and emergency overflow scuppers are adequate. Ensure that these scuppers are positioned such that their bottoms are not less than 2" nor more than 4" above roof level. Care should be taken to ensure that ponding water in excess of 5" does not occur at any time at any portion of the roof.

The information provided in these specifications is for general informational purposes only. The contractor is responsible for obtaining a re-roofing permit and coordinating with the Building Department for all necessary in-progress and final inspections. All testing and engineering necessary to obtain a permit and complete this job are the also the contractor's responsibility.

The roof contractor must be certified by CertainTeed Corp to install this roof system. The contractor must provide a 20-year NDL warranty on labor and materials. All work should be done in accordance with the Florida Building Code (2017), including applicable HVHZ protocols. All installation, product and safety guidelines of the roof system manufacturer, along with OSHA mandated safety guidelines should be followed. In case of conflicts, the more stringent standard should be followed.

Safety and Clean-Up

The contractor, its employees, representatives, agents and sub-contractors should observe all safety precautions as required by OSHA during the entire duration of this project. The contractor should also clean-up on a daily basis. This is an occupied facility and contractor must maintain the site in a presentable fashion at all times.

Insurance Requirements

The roofing contractor must maintain all necessary licenses and insurance certificates throughout the duration of the job.

Mail Sealed Bids:

University of Florida
College of Design, Construction & Planning
P. O. Box 115701
Gainesville, FL 32611-5701

Ph (352) 222 6147 Fax (561) 245 4447

Deadline: Bid Packages must be received by **5:00 PM on May 15, 2018.**

All technical questions concerning this bid package may be addressed directly to Quest Engineering Services & Testing, Inc. If there are any technical questions, please contact:

R. N. Sailappan, P.E., *Quest Engineering Services & Testing, Inc.*, **Ph (954) 582 9800**

REROOFING SPECIFICATIONS

This section outlines the general guidelines for the bidding and reproofing at the subject site. The guidelines under the general sub-section apply to the entire project.

General

1. Only those bidders on the invited bidders list are eligible to bid on this project.

2. All bidders must be licensed in the State of Florida and have a minimum of 5 years of experience providing such services.

3. The bid should also identify the bidder's contact person and contact information.

4. All bidders should maintain appropriate licenses and insurance requirements during the entire project duration. The liability insurance policy should name AMPCO as additional insured. The minimum insurance requirements are as follow:

Workman's Compensation	-	Statutory Limits
General Liability & Property Damage	-	$1,000,000.00

5. The bid packages should include the following:

   a) Bidder's Contact Information
   b) Filled out Bid Form with Cost Proposal for Roof Replacement with breakdowns for all 3 facets, namely:

      Deck Re-fastening to satisfy new diaphragm shear enhancements
      Enhance Edge Connections to satisfy new diaphragm shear enhancements
      Deck Replacement to satisfy new diaphragm shear enhancements

REQUIRED SUBMITTALS BY SELECTED CONTRACTOR

A. Prior to starting work, the roofing contractor must submit the following:

1. Shop drawings showing layout, details of construction and identification of materials.

2. A sample of the manufacturer's Membrane System Warranty.

3. Submit a letter of certification from the manufacturer which certifies the roofing contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.

4. Certification of the manufacturer's warranty reserve.

B. Upon completion of the installed work, submit copies of the manufacturer's final inspection to the specifier prior to the issuance of the manufacturer's warranty.

BID FORM

Contractor:

Date till which Price is Valid:

Cost Proposal:

1. Base Bid for Roof Replacement $ _____

2. Fee for Investigating Deck Thickness & Attachment to Joists $ _____
   Cut and expose Composite deck on top side of deck at 4 locations
   (4' x 4' opening) to verify deck fastening

3. Fee for Fastener Withdrawal Tests (TAS-105) $ _____
   Cut, test and patch all test locations

4. Fee for Deck Re-fastening (where required) – Two #12 TEK
   screws per flute; screwed from joist top chord to deck underside $ _____
   Sidelap #10 screws screwed from deck underside at 12" o.c.
   Joists are spaced at 5' o.c. (i.e.) 31 Joists & 2 Bays

5. Fee for Investigating Deck Edge Attachment $ _____
   Cut and expose Drywall/drop-down ceiling along roof perimeter
   to verify deck edge fastening and Joist anchoring

6. Additional Cost for Enhanced Edge and Support Connections $ _____
   434 linear feet of perimeter; 124 Joist Bearing Points
   Install 3" x 3" x ¼" deck ledger angle all along roof deck perimeter
   secured to wall with Ø ½" expansion anchor bolts at 24" o.c.
   (bolts to have minimum 4" embedment into filled cell of wall) and
   to each joist with two Ø 3/8" bolts and nuts.

7. Unit Cost for Partial Deck Replacement $ _____
   Removal of existing composite boards and disposal
   Removal and disposal of metal decks
   Grinding of welds/removal of screws
   Replacement deck to be 22 ga. and match the profile of existing deck
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)
   Install ISO insulation and mineral board to match Composite system thickness

8. Additional Cost for Full Deck Replacement $ _____
   Removal and disposal of composite boards and metal decks
   Grinding of welds/removal of screws
   Replacement deck to be 22 ga. 1.5" Corrugated, Type 'B'
   Replacement sheets should span minimum 15 feet (3 joist spacings)
   Deck to be secured to joists in 36/7 pattern with #12 TEK screws
   Deck sidelaps to be fastened with #10 screws at 12" o.c. (4 screws per span)
   Install 1.5" thick ISO insulation

9. Associated Engineering Cost $ _____

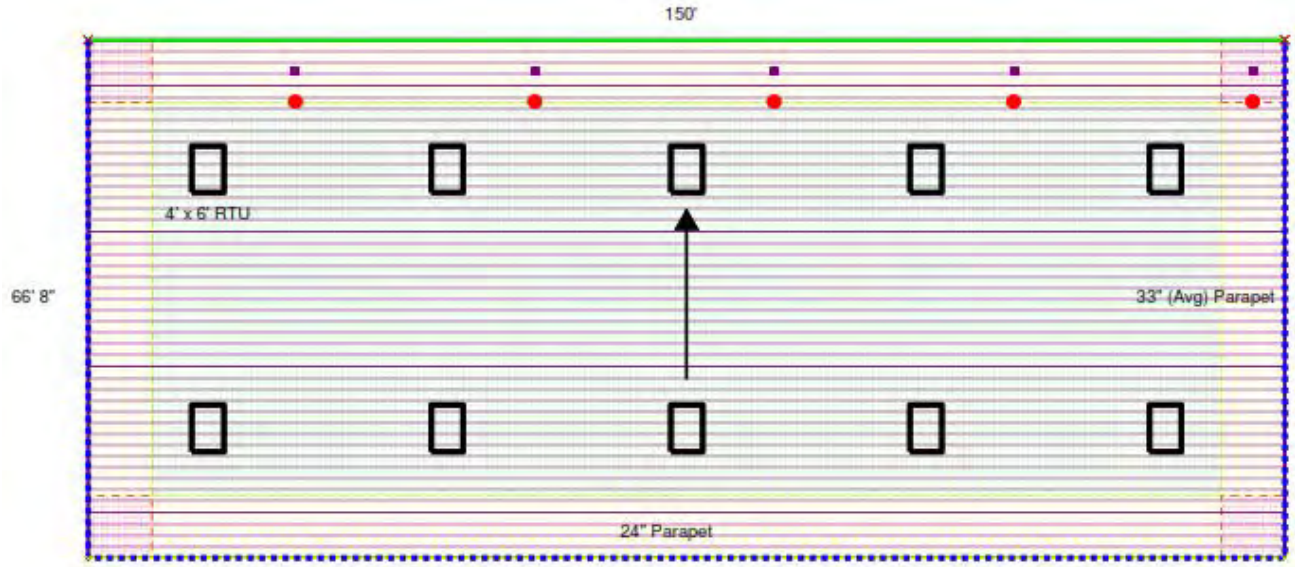
All work will be done by licensed personnel after obtaining relevant permits, in accordance with the Florida Building Code (2017). This bid is acknowledged and submitted by:

Signature: _____

Name: _____

Firm Name: _____

Date: _____



Lightweight Engineered Composite Deck

N

Legend	Pitch	Description
	<none>	Perimeter
	0.25/12	Remove Mod Bit Leave Ld Mstr
	0.25/12	1/2" Wood Fiber Mech Attchd over Ld Mstr
	0.25/12	1/2" Wood Fiber Mech Attchd over Ld Mstr
	0.25/12	1/2" Wood Fiber Mech Attchd over Ld Mstr
	0.25/12	Mod Bit, Ply Bs, GMS (Insltn)
	<none>	1/2 Sht Flsh & Cant @ Curbs
	<none>	Flsh & Cant (ms) 24" HIgh Wall
	<none>	Flsh & Cant (ms) 33" (Avg) HIgh Wall
	0.25/12	VTR Flashing w/ 3" Lead Boot
	0.25/12	Vent 10" GRV
	0.25/12	End of Flsh Closure & Trim
	0.25/12	Metal Edge over Existing Gutter
	<none>	Coping (Cap) @ Parapet
	0.25/12	Coping End
	0.25/12	Coping Miter

QuEST

Quest Engineering Services & Testing, Inc.
2737 NW 19th Street
Pompano Beach, FL – 33069

Ph (954) 582 9800 **Fax (954) 582 9836**

Title:	**ROOF PLAN**
Project:	**Americana Building** **123 Washington Avenue** **Anytown, FL - 30000**
Client:	**UF College of Design, Construction & Planning**

Dimensions indicated are approximate. Contractor must field verify before bidding.

Scale: NTS

Project No.	Drawn	Sheet No.	Revision No.	Revision Date
J-17284	**RNS**	**1 of 1**		

BASE SHEET ATTACHMENT CALCULATIONS

Project Name Americana Warehouse Building **Report No.:** J-17284.007
Project Address 123 Washington Avenue
Anytown, FL - 30000

Deck Substrate	Composite	Mean Roof Height	16.0 Feet
Configuration	Low Slope	Roof Area (Approx.)	10000 Sq.Ft.
Category	II	Roof Width	66.7 Feet
Exposure Condition	C	Perimeter Width	6.4 Feet
Building Type	Enclosed	Parapet Height	2.0 Feet
Base Wind Speed	170 mph	Corner Zones	6.4' x 6.4' Each

Slope V 0.0 Slope H 12.0 Slope Angle° 0.00

Uplift Pressures $q_z = 0.00256\ K_z\ K_{zt}\ K_d\ V^2$ $P = q_z\ (GC_p - GC_{pi})$

q_z	K_z	K_{zt}	K_d	V	GC_p	GC_{pi}	
54.384	0.860	1.005	0.85	170	-1.00	0.18	Field
					-1.80	0.18	Perimeter
					-2.80	0.18	Corner

Field	$P_{1\ ult.}$	-64.17 psf	$P_{1\ asd}$	-38.50 psf	
Perimeter	$P_{2\ ult.}$	-107.68 psf	$P_{2\ asd}$	-64.61 psf	
Corner	$P_{3\ ult.}$	-162.06 psf	$P_{3\ asd}$	-97.24 psf	

Proposed System CertainTeed Modified Bitumen Roof System
Product Approval No. 17-1003.08 (Page 24 of 25) Fastening #2
System Design Pressure -60 psf

Fasteners #14 Screws and Plates (Fastened thru' mineral boards into steel deck)

Base Sheet Width 39 inches Side Lap 4 inches Net Width 35 inches

Fastener Spacing in	Lap of Base Sheet	9 inches	# Rows	1
Fastener Spacing in	Field of Base Sheet	9 inches	# Rows	2

Min. Characteristic Resistance Force -43.75 lbf Verify with TAS-105 Tests

Fastener Spacing {(MCRF/P_i) x 144}/Row Spacing

No. of Rows of Fasteners	3	4	5	6
Field Fastener Spacing	14.02	18.70	23.37	28.05
Perimeter Fastener Spacing	8.36	11.14	13.93	16.72
Corner Fastener Spacing	5.55	7.40	9.26	11.11

RECOMMENDED BASE SHEET ATTACHMENT PATTERN

Field	1 row in the laps at 9 inches o.c.	2 rows in the center of the sheet at 9" o.c.
Perimeter	1 row in the laps at 8 inches o.c.	2 rows in the center of the sheet at 8" o.c.
Corner	1 row in the laps at 7 inches o.c.	3 rows in the center of the sheet at 7" o.c.

These calculations have been done in accordance with ASCE 7-10, based on the information provided by the contractor. The roof system must be installed in accordance with the FBC & manufacturer's recommendations. We recommend TAS-105 Tests to verify that above MCRF may be realized, before installing new roof.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

Quest Engineering Services & Testing, Inc. (CA # 7954), 2737 NW 19 St., Pompano Beach, FL-33069 Ph (954) 582 9800 Fax (954) 582 9836

DRAINAGE EVALUATION

Project Name Americana Warehouse Building
Project Address 123 Washington Avenue
Anytown, FL - 33000

Report No.: J-17284.007

The following values are from the Florida Building Code (2010), Plumbing Code, for a 5" per hour rainfall rate

Vertical Leaders	Pipe Ø	2"	3"	4"	5"	6"	8"	
Table 1106.2(1)	Roof Area	575	1760	3680	6920	10800	23200	
Horizontal Piping	Pipe Ø		3"	4"	5"	6"	8"	10"
Table 1106.3	Roof Area		657	1504	2672	4280	9200	16580
Table 1106.7	Length	4"	6"	8"	12"	16"	20"	24"
Weirs (4" Head)	Roof Area	1794	2692	3589	5384	7179	8974	10769
Weirs (3" Head)	Roof Area	1153	1730	2307	3461	4615	5769	6923

ROOF DETAILS

Mean Roof Height 16.0 Feet
Slope V 1/8" : 12

Roof Area (Approx.) 10000 Sq.Ft.
Tributary Roofs 0 Sq.Ft.

		Length (ft)	Height (ft)
Side Walls	1	0	0
	2	0	0
	3	0	0

		Length (ft)	Height (ft)
Parapets	1	434	2
	2	0	0
	3	0	0

Effective Roof Area for Drainage purposes 10434 ft^2

PRIMARY	VERTICAL DRAINS Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1	3.50	9.62	5	11975
Type 2				
Type 3				

THROUGH-WALL SCUPPERS (WEIRS)	Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

SECONDARY	VERTICAL Size Ø	Area	# Drains	Drainage Cap. (ft^2)
Type 1				
Type 2				
Type 3				

THROUGH-WALL SCUPPERS (WEIRS)	Height (in)	Length (in)	# Drains	Drainage Cap. (ft^2)
Type 1	4	12.00	4	13844
Type 2				
Type 3				

Total Primary Drain Capacity of Existing Drains 11975 ft^2 Adequate

Total Secondary Drain Capacity of Existing Scuppers 13844 ft^2 Adequate

These calculations have been done in accordance with FBC (2017), based on the information provided by the contractor. Position drainage elements such that no more than 5" of ponding occurs anywhere on roof at any time.

Sincerely
Quest Engineering Services & Testing, Inc.

DRAFT

R. N. Sailappan, P.E.
Principal
Florida Registration No. 46696

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786) 315-2590 F (786) 315-2599
www.miamidade.gov/economy

NOTICE OF ACCEPTANCE (NOA)

Loadmaster Systems, Inc.
3100 Northwoods Place, Suite E
Peachtree Corners, GA 30071

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami-Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (in Miami-Dade County) and/or the AHJ (in areas other than Miami-Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.
This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: Loadmaster Duraflex Mineral Board

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA renews NOA No. 12-0913.10 and consists of pages 1 through 3.
The submitted documentation was reviewed by Hamley Pacheco, P.E.

NOA No.: 17-1023.02
Expiration Date: 09/12/22
Approval Date: 11/23/17
Page 1 of 3

ROOFING COMPONENT APPROVAL

Category: Roofing
Sub-Category: Insulation
Material: Gypsum

TYPICAL PHYSICAL PROPERTIES:

Product	Property	Test Method	Typical Result
½" Loadmaster Duraflex Mineral Board	Flexural Test	ASTM C 473	146 lbf (perpendicular) 60 lbf (parallel)
	Hardness	ASTM C 473	59 lbf (core) 58 lbf (end) 73 lbf (edge)
	Nail Pull Resistance	ASTM C 473	140 lbf
	Humidified Deflection	ASTM C 473	1/8"
	Water Resistance	ASTM C 473	5%
	Surface Water Resistance	ASTM C 473	1.6g

Product	Property	Test Method	Typical Result
5/8" Loadmaster Duraflex Mineral Board	Flexural Test	ASTM C 473	190 lbf (perpendicular) 80 lbf (parallel)
	Hardness	ASTM C 473	43 lbf (core) 39 lbf (end) 78 lbf (edge)
	Nail Pull Resistance	ASTM C 473	125 lbf
	Humidified Deflection	ASTM C 473	1/8"
	Water Resistance	ASTM C 473	3%
	Surface Water Resistance	ASTM C 473	1.5g

Note: The physical properties listed above are presented at typical average values as determined by accepted ASTM test methods and are subject to normal manufacturing variation. Numerical ratings as determined by ASTM Test Method E-84 are not intended to reflect hazards presented by this or any other material under actual fire conditions.

MANUFACTURING LOCATION(S):

1. Sweetwater, TX.

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
Progressive Engineering Inc.	ASTM C1396	2014-941	09/15/14
Exterior Research & Design, LLC	ASTM C79/C79M	10073.03.02-1	03/15/02

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

Tradename:	**Loadmaster Duraflex Mineral Board**
Thickness:	½" and 5/8"
Board Size(s)	4' x 12.5' (1.2 x 3.7 m)
Core:	Gypsum
Facers:	Heavy Bonded Paper
Decks:	Concrete, Cementitious Wood Fiber, Steel, Wood, Lightweight Concrete, Gypsum
Special Application:	See specific Roof Assembly NOA, and RAS 117 for specific system approvals.

COMMENTS AND LIMITATIONS:

1. Roof assemblies are approved under specific roof cover's Product Control Notice of Acceptance.
2. Loadmaster Duraflex Mineral Board may be used with any approved roof covering listing Loadmaster Duraflex Mineral Board as a component part of a roof assembly Notice of Acceptance. If a Loadmaster Duraflex Mineral Board is not listed, a request may be made to the authority having jurisdiction or the Miami Dade Building Code Compliance Office for approval provided that appropriate documentation is provided.
3. Fire classification is not a part of this Notice of Acceptance
4. All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.
5. All approved products listed herein shall be labeled and shall bear the imprint or identifiable marking of the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved" or the Miami-Dade County Product Control Seal as shown below.

MIAMI-DADE COUNTY APPROVED

END OF THIS ACCEPTANCE

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786)315-2590 F (786) 31525-99
www.miamidade.gov/economy

DEPARTMENT OF REGULATORY AND ECONOMIC RESOURCES (RER)
BOARD AND CODE ADMINISTRATION DIVISION

NOTICE OF ACCEPTANCE (NOA)

CertainTeed Corporation
20 Moores Road
Malvern, PA 19355

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed and accepted by Miami-Dade County RER - Product Control Section to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. RER reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: CertainTeed Modified Bitumen Roof System over Poured Gypsum Decks.

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA renews NOA #14-0529.06 and consists of pages 1 through 25.
The submitted documentation was reviewed by Alex Tigera.

MIAMI-DADE COUNTY APPROVED

NOA No.: 17-1003.08
Expiration Date: 04/28/23
Approval Date: 04/19/18
Page 1 of 25

ROOFING SYSTEM APPROVAL

Category: Roofing
Sub-Category: Modified
Material: APP, SBS
Deck Type: Poured Gypsum
Maximum Design Pressure: **-67.5 psf**

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
All Weather/Empire Base Sheet	39 3/8" x 65'10"; Roll weight: 70 lbs. (2 squares)	ASTM D 4601 Type II UL Type G2	Asphalt coated, fiberglass reinforced base sheet.
Flexiglas Base Sheet	39 3/8" x 98'9"; Roll weight: 90 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Modified Bitumen coated fiberglass base sheet.
Flintlastic Base 20	39 3/8" x 49'6"; Roll weight: 90 lbs. (1.5 squares)	ASTM D 6163, Grade S, Type I	Modified Bitumen coated fiberglass base sheet.
Flintglas Ply Sheet Type IV	39 3/8" x 164'7"; Roll weight: 38 lbs. (5 squares)	ASTM D 2178 Type IV UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintglas Premium Ply Sheet Type VI	39 3/8" x 164'7"; Roll weight: 40 lbs. (5 squares)	ASTM D 2178 Type VI UL Type G1	Fiberglass, asphalt impregnated ply sheet.
Flintlastic STA	39 3/8" x 32'10"; Roll weight: 87 lbs. (1 square)	ASTM D 6222, Grade S, Type II	Smooth surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GTA-FR	39 3/8" x 32' 10"; Roll weight: 105 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application.
Flintlastic GMS	39 3/8" x 32' 10"; Roll weight: 94 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic Premium FR-P	39 3/8" x 32' 10"; Roll weight: 101 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application.
Flintlastic FR Dual Cap	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6162, Grade G, Type I	Granule surfaced SBS modified bitumen membrane with a nonwoven polyester/fiberglass composite mat reinforcement for use in cold or mop applications.
Flintlastic FR Cap 30	39 3/8" x 32' 10"; Roll weight: 86 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications.
Flintlastic FR Cap 30 T	39 3/8" x 32''10"; Roll weight: 100 lbs. (1 square)	ASTM D6163, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for torch application.
Flintlastic Base 20 T	39 3/8" x 33'; Roll Weight: 81 lbs. (1 square)	ASTM D6163, Grade S, Type I	Modified Bitumen, coated fiberglass base sheet for torch application.
Flintlastic FR Cap 30 CoolStar	39 3/8" x 32' 10"; Roll weight: 88 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic FR Cap 30 T CoolStar	39 3/8" x 32' 10"; Roll weight: 102 lbs. (1 square)	ASTM D 6163, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen membrane with fiberglass mat reinforcement for mop applications. Covered with reflective CoolStar Coating.
Flintlastic GTA CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic GTA-FR CoolStar	39 3/8" x 32' 10"; Roll weight: 106 lbs. (1 square)	ASTM D 6222, Grade G, Type I	Granule surfaced APP Modified Bitumen membrane with non-woven polyester mat reinforcement for torch application. Covered with reflective CoolStar Coating.
Flintlastic GMS CoolStar	39 3/8" x 32' 10"; Roll weight: 97 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Granule surfaced SBS Modified Bitumen membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type I	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Premium FR-P CoolStar	39 3/8" x 32' 10"; Roll weight: 103 lbs. (1 square)	ASTM D 6164, Grade G, Type II	Fire resistant, granule surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop application. Covered with reflective CoolStar Coating.
Flintlastic Ultra Poly SMS Base Sheet	39 3/8" x 32' 10"; Roll weight: 90 lbs. (1 square)	ASTM D 6164, Grade S, Type I	Smooth surfaced SBS Modified Bitumen Membrane with non-woven polyester mat reinforcement for mop applications.
Glasbase Base Sheet	39 3/8" x 98'9"; Roll weight: 75 lbs. (3 squares)	ASTM D 4601, Type II UL Type G2	Asphalt coated, fiberglass base sheet.
Flintlastic Poly SMS Base Sheet	39 3/8" x 64' 3"; Roll weight: 90 lbs. (2 squares)	ASTM D 4601, Grade S, Type II UL Type G2	Modified Bitumen coated polyester base sheet.
Yosemite Venting Base Sheet	39 3/8" x 32'10"; Roll weight: 85 lbs. (1 square)	ASTM D 3909 ASTM D 4897, Type II UL Type G3	Mineral Surfaced fiberglass reinforced buffer sheet.
Flintlastic APP Base T	39 3/8" x 65' 4"; Roll weight: 100 lbs. (2 squares)	ASTM D6509	Modified Bitumen coated fiberglass base sheet.

TRADE NAMES OF PRODUCTS MANUFACTURED OR LABELED BY APPLICANT:

TABLE 1

Product	Dimensions	Test Specification	Product Description
Flintlastic Ultra Glass SA	39 3/8" x 33'11"; Roll weight: 73 lbs. (1 square)	ASTM D1970	Self-adhering, fiberglass reinforced, SBS modified bitumen base/ply sheet.
Black Diamond™ Base Sheet	36" x 68'7"; Roll weight: 78 lbs. (2 squares)	ASTM D 1970	Self-adhering fiberglass reinforced modified bitumen base sheet

APPROVED INSULATIONS:

TABLE 2

Product Name	Product Description	Manufacturer (With Current NOA)
FlintBoard ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
FlintBoard ISO Cold	Polyisocyanurate foam insulation	CertainTeed Corp.
$FlintBoard_H$ ISO	Polyisocyanurate foam insulation	CertainTeed Corp.
$FlintBoard_H$ ISO Cold	Polyisocyanurate foam insulation	CertainTeed Corp.
ACFoam-II	Polyisocyanurate foam insulation	Atlas Roofing Corporation
ACFoam-III	Polyisocyanurate foam insulation	Atlas Roofing Corporation
ISO 95+ GL	Polyisocyanurate foam insulation	Firestone Building Products Co.
Stuctodek High Density Fiberboard Roof Insulation	Wood fiber insulation board	Blue Ridge Fiberboard, Inc.
H-Shield, H-Shield CG	Polyisocyanurate foam insulation	Hunter Panels LLC
DensDeck	Water resistant gypsum board	Georgia Pacific Gypsum LLC
DensDeck Prime	Water resistant gypsum board	Georgia Pacific Gypsum LLC
ENRGY 3	Polyisocyanurate foam / wood fiberboard composite insulation	Johns Manville Corp.
ENRGY 3 25 PSI	Polyisocyanurate foam / wood fiberboard composite insulation	Johns Manville Corp.
Ultra-Max	Polyisocyanurate roof insulation	RMax Operating, LLC
Multi-Max FA-3	Polyisocyanurate roof insulation	RMax Operating, LLC
FescoBoard	Expanded mineral fiber insulation	Johns Manville Corp.
SECUROCK Gypsum-Fiber Roof Board	Gypsum insulation	United States Gypsum Corp.

APPROVED FASTENERS:

TABLE 3

Fastener Number	Product Name	Product Description	Dimensions	Manufacturer (With Current NOA)
1.	Trufast FM-90 Base Sheet Fastener	Base ply fastening systems for lightweight concrete decks.	2.7" x 1.7"	Altenloh, Brinck & Co. U.S., Inc.
2.	Trufast Twin Loc-Nail Assembled Fastener	Galvanized stress plate and tube with integrated locking staple	2.7" round x various lengths	Altenloh, Brinck & Co. U.S., Inc.

APPROVED SURFACING/COATING OPTIONS:

TABLE 4

Chosen components must be applied according to manufacturer's application instructions. Any coating, listed below, used as a surfacing, must be listed within a current NOA.

System Number	Manufacturer	Application
1.	Generic	Gravel applied at 400 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
2.	Generic	Slag applied at 300 lbs/sq., adhered with flood coat of asphalt at 60 lbs/sq.
3.	Karnak Corp.	Karnak (#97 AF) Fibrated Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
4.	CertainTeed Corp.	FlintCoat A-150 applied at an application rate of 1.5 gal/sq.
5.	Gardner Asphalt Corp.	APOC #212 Fibered Aluminum Roof Coating applied at an application rate of 1.5 gal/sq.
6.	Gardner Asphalt Corp.	APOC #400 Sunbrite applied at an application rate of 3 gal./sq.

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
Factory Mutual Research Corp.	FM 4470	3Y8A1.AM	03/23/96
	FM 4470	0D3A3.AM	04/04/97
	FM 4470	2D0A0.AM	12/23/98
	FM 4470	1D7A4.AM	11/09/98
	FM 4470	3039046	06/15/10
	FM 4470	3048520	09/19/13
Underwriters Laboratories, Inc.	UL 790	R11656	01/11/13
United States Testing Company	ASTM D 5147	97-457-2R	12/02/87
	ASTM D 5147	97457-4	06/03/88
Momentum Technologies, Inc.	ASTM D6164	AX31G8F	06/05/09
Trinity|ERD	TAS 114(J)	#3504.06.01-1	06/05/01
	TAS 114	3533.01.06	01/06/06
	TAS 114 (H)	Letter	04/05/06
	TAS 117 (B)	3503.10.06	10/10/06
	TAS 117 (B)	O6490.04.07-R1	06/27/07
	TAS 114	3521.07.04-R1	10/26/07
	TAS 117 (B)/ ASTM D 6862	C8500SC.11.07	11/30/07
	TAS 114	C8370.08.08	08/19/08
	TAS 117 & TAS 114	C30560.03.10	03/18/10
	ASTM Physical Properties	C10080.09.08-R4	03/25/10
	ASTM D6164/D4798	C31410.01.11-2	01/10/11
	TAS 117 B	C35500.02.11	02/09/11
	ASTM D1876	C35460.05.11	06/16/11
	ASTM D4601	C40050.09.12-1	09/28/12
	ASTM D1876, TAS 114 (H), TAS 117 (B)	C42110.08.12	08/13/12
	ASTM D1970	C40050.09.12-2	09/28/12
	ASTM D5147/D4798	C31410.10.10-R1	11/01/12
	ASTM D5147/D4798	C31410.01.11-1-R1	11/01/12
	ASTM D4798	C31410.01.11-2A-R1	02/21/13
	ASTM D4798	C31410.12.13	12/05/13
	ASTM D6222	C40050.12.13	12/05/13
	ASTM D1876, TAS 114 (H), FM 4474	C47320.03.14-R1	04/01/15
	ASTM D4601-04 (2012), Type II	CTR-SC11145.09.16-3A	09/19/16
PRI Construction Materials Technologies LLC	ASTM D6163	CTC-066-02-01	08/09/11
	ASTM D6222	CTC-070-02-01	08/09/11
	ASTM D6164/D4798	CTC-093-02-01	08/09/11
	ASTMD 4601	CTC-126-02-01	03/12/12
	ASTM D2178	CTC-122-02-01	03/13/12
	ASTM D4601	CTC-127-02-01	03/13/12

EVIDENCE SUBMITTED:

Test Agency/Identifier	Name	Report	Date
	ASTM D6509	CTC-116-02-01	04/04/12
	ASTM D6163	CTC-128-02-01	06/11/12
	ASTM D6163	CTC-129-02-01	06/11/12
	ASTM D6164	CTC-132-02-01	06/11/12
	ASTM D6164	CTC-161-02-01	05/09/13
	ASTM D6162	CTC-183-02-01	10/02/13
	ASTM D6164	CTC-190-02-01	12/02/13
	ASTM D1970	CTC-199-02-01	01/22/14
	ASTM D6222	CTC-071-02-01	08/08/11
	ASTM D6163	CTC-319-02-01	08/22/17

Membrane Type: SBS Modified

Deck Type 6I: Poured Gypsum, Non-Insulated

Deck Description: Poured Gypsum Concrete

System Type E(4): Base sheet mechanically fastened.

All General and System limitations apply.

Base Sheet: One ply of All Weather/Empire Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet or Yosemite Venting Base Sheet mechanically fastened to the deck as detailed below:

Fastening #1: Trufast Twin Loc-Nail Assembled Fasteners spaced 7" o.c. in 4" side lap and two staggered rows in center of the sheet, 7" o.c.
(Maximum Design Pressure –67.5 psf, See General Limitation #9.)

Fastening #2: Trufast Twin Loc-Nail Assembled Fasteners spaced 9" o.c. in 4" side lap and two staggered rows in center of the sheet, 9" o.c.
(Maximum Design Pressure –60 psf, See General Limitation #9.)

Ply Sheet: (Optional) One ply of All Weather/Empire Base Sheet, Glasbase Base Sheet, Flexiglas Base Sheet, Flintlastic Base 20, Flintlastic Poly SMS Base Sheet, Flintlastic Ultra Poly SMS Base Sheet or one or more plies of Flintglas Ply Sheet Type IV or Flintglas Premium Ply Sheet Type VI adhered to the base sheet in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or Flintlastic Ultra Poly SMS Base Sheet torch applied or one ply of Black Diamond Base Sheet or Flintlastic Ultra Glass SA self-adhered.

Membrane: One ply of Flintlastic GMS, Flintlastic GMS CoolStar, Flintlastic FR Dual Cap, Flintlastic FR-P, Flintlastic FR-P CoolStar, Flintlastic FR Cap 30, Flintlastic FR Cap 30 CoolStar applied to the base sheet or ply sheet in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq. or Flintlastic FR Cap 30 T or Flintlastic FR Cap 30 T CoolStar torch adhered to base or ply sheet.

Surfacing: (Optional) Any of the approved surfacing/coating options listed in Table 4.

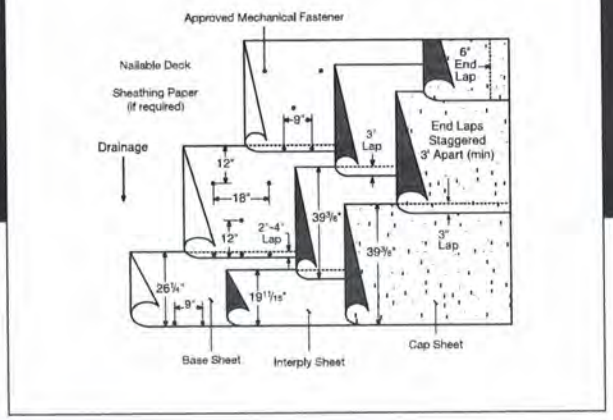
Maximum Design Pressure: See fastening requirements above

GENERAL LIMITATIONS:

1. Fire classification is not part of this acceptance; refer to a current Approved Roofing Materials Directory for fire ratings of this product.
2. Insulation may be installed in multiple layers. The first layer shall be attached in compliance with Product Control Approval guidelines. All other layers shall be adhered in a full mopping of approved asphalt applied within the EVT range and at a rate of 20-40 lbs./sq., or mechanically attached using the fastening pattern of the top layer
3. All standard panel sizes are acceptable for mechanical attachment. When applied in approved asphalt, panel size shall be 4' x 4' maximum.
4. An overlay and/or recovery board insulation panel is required on all applications over closed cell foam insulations when the base sheet is fully mopped. If no recovery board is used the base sheet shall be applied using spot mopping with approved asphalt, 12" diameter circles, 24" o.c.; or strip mopped 8" ribbons in three rows, one at each side lap and one down the center of the sheet allowing a continuous area of ventilation. Encircling of the strips is not acceptable. A 6" break shall be placed every 12' in each ribbon to allow cross ventilation. Asphalt application of either system shall be at a minimum rate of 12 lbs./sq.
   Note: Spot attached systems shall be limited to a maximum design pressure of -45 psf.
5. Fastener spacing for insulation attachment is based on a Minimum Characteristic Force (F') value of 275 lbf., as tested in compliance with Testing Application Standard TAS 105. If the fastener value, as field-tested, are below 275 lbf. insulation attachment shall not be acceptable.
6. Fastener spacing for mechanical attachment of anchor/base sheet or membrane attachment is based on a minimum fastener resistance value in conjunction with the maximum design value listed within a specific system. Should the fastener resistance be less than that required, as determined by the Building Official, a revised fastener spacing, prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant may be submitted. Said revised fastener spacing shall utilize the withdrawal resistance value taken from Testing Application Standards TAS 105 and calculations in compliance with Roofing Application Standard RAS 117.
7. Perimeter and corner areas shall comply with the enhanced uplift pressure requirements of these areas. Fastener densities shall be increased for both insulation and base sheet as calculated in compliance with Roofing Application Standard RAS 117. Calculations prepared, signed and sealed by a Florida registered Professional Engineer, Registered Architect, or Registered Roof Consultant **(When this limitation is specifically referred within this NOA, General Limitation #9 will not be applicable.)**
8. All attachment and sizing of perimeter nailers, metal profile, and/or flashing termination designs shall conform to Roofing Application Standard RAS 111 and applicable wind load requirements.
9. The maximum designed pressure limitation listed shall be applicable to all roof pressure zones (i.e. field, perimeters, and corners). Neither rational analysis, nor extrapolation shall be permitted for enhanced fastening at enhanced pressure zones (i.e. perimeters, extended corners and corners). **(When this limitation is specifically referred within this NOA, General Limitation #7 will not be applicable.)**
10. All products listed herein shall have a quality assurance audit in accordance with the Florida Building Code and Rule 61G20-3 of the Florida Administrative Code.

END OF THIS ACCEPTANCE

SBS-N-3-A



Base sheet, one interply sheet and an SBS modified cap sheet

SUBSTRATE:
- Nailable (mechanically attached, Sec. 3.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
Approved base sheet, mechanically attached to approved substrate (Sec. 15.0).

Approved interply sheet set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- Base sheet (1 ply)
- Interply sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if interply is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED INTERPLY SHEETS:
(one of the following)
- All Weather/ Empire Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas Base Sheet
- Flintlastic Base 20
- Flintglas® Ply 4
- Flintglas Premium Ply 6
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

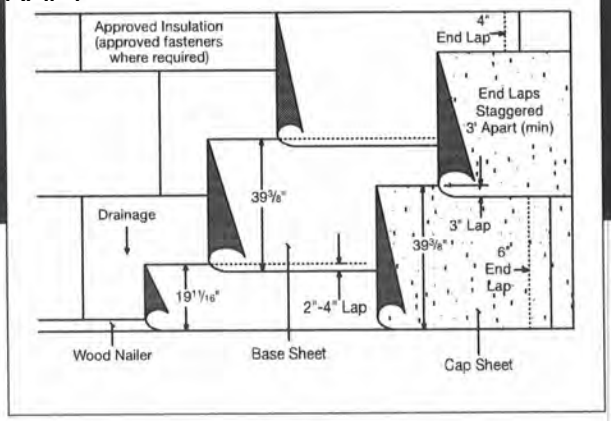
Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

Consult CertainTeed General Recommendations for noted section references.

CertainTeed SAINT-GOBAIN
Commercial Roofing

SBS-I-2-A

Insulated substrates: base sheet and an SBS modified cap sheet



SUBSTRATE:
- Steel and nailable (mechanically attached, Sec. 15.4)
- Non-nailable (adhered, Sec. 4.0)
- Insulation (Sec. 4.0)
- Re-cover (Sec. 5.0)

MAXIMUM SLOPE:
Up to 6" : 12" (Sec. 15.3)

ROOF ASSEMBLY:
One or more layers of approved insulation and/or coverboard:
- Base layer mechanically attached and additional layers mechanically attached or adhered in hot asphalt or approved adhesive.
- Base layer and additional layers adhered in hot asphalt or approved adhesive.
- Vapor retarder/anchor sheets (Sec. 4.7).

Approved base sheet, set in hot asphalt (Sec. 7.0) or self-adhered (Sec. 10.2).

Approved cap sheet, mopped in hot asphalt (Sec. 7.0).

SUMMARY OF MATERIALS:
- One or more layers of insulation and/ or coverboard
- Base sheet (1 ply)
- Cap sheet (1 ply)
- ASTM D 312 asphalt (two moppings) (One mopping if base sheet is self-adhered)

APPROVED BASE SHEETS:
(one of the following)
- All Weather/Empire® Base Sheet
- Black Diamond® Base Sheet (self-adhered)
- Flexiglas® Base Sheet
- Flintlastic Base 20
- Flintlastic Poly SMS
- Flintlastic Ultra Glass SA (self-adhered)
- Flintlastic Ultra Poly SMS
- Glasbase™ Base Sheet
- Yosemite® Venting Base Sheet

APPROVED CAP SHEETS:
(one of the following)
- Flintlastic FR Cap 30*
- Flintlastic FR-P*
- Flintlastic GMS*
- Flintlastic Premium FR-P*

FINAL SURFACING:
For optional surfacing see Section 14.0.

FLASHING ASSEMBLY:
- **Standard.** Over a base sheet or bonded to a primed substrate. One ply Flintlastic modified cap sheet, per CT detail.
- **Premium.** Over a base sheet or bonded to a primed substrate. One smooth and one granulated modified membrane flashing, per CT detail.
- **Premium Alternate.** Over a base sheet or bonded to a primed substrate. One smooth modified membrane and CT SmartFlash®, per CT detail.

Asphalt: Type III or Type IV (Sec. 7.0).

Cants: In angles of roof deck and vertical surfaces, the roofing contractor shall furnish and install an approved cant strip with a minimum 3" face.

**Available with CoolStar® reflective granules*

WARRANTY DURATIONS FOR THIS SPECIFICATION VARY BASED ON ROLL MATERIAL SELECTION; SEE WARRANTY MATRIX.

Applicable local building code may require more stringent installation requirements such as, but not limited to, increased fastener or adhesive densities to meet required wind uplift pressures. Consult local building code and uplift requirements prior to any application of CertainTeed roofing materials. CertainTeed is not responsible for failure to install roofing products per applicable local building codes.

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Consult CertainTeed General Recommendations for noted section references.