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NEMO EVALUATION REPORT (NER)

The Garland Company, Inc.
3800 East 91st Street
Cleveland, OH, 44105
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SUBJECT:	**Garland KEE-Stone HP Hybrid Roof Systems**
SCOPE:	This NEMO Evaluation Report (henceforth 'NER') is issued under F.A.C. Rule 61G20-3 and the applicable rules and regulations governing Product Approval of construction materials in the State of Florida and ISO/IEC 17065 via NEMO|cert. NEMO Evaluations has evaluated the product described herein for compliance with the Code sections noted herein.
CODE:	2024 and 2018 International Building Code — TDI Third-Party Evaluation Report acceptance 2023 Florida Building Code, 8th Edition 2022 California Building Code 2023 City of Los Angeles Building Code — Section 98.0501, Product Approval, Alternate Materials, Systems, Devices and Methods of Construction 2023 County of Los Angeles Building Code
FBC JURISDICTION:	Non-HVHZ and HVHZ
CATEGORY:	**FBC:** Roofing — **NEMO:** Single Ply
SUB-CATEGORY:	**FBC:** Single Ply Roof Systems
CSI DIVISION:	07 00 00 Thermal and Moisture Protection 07 54 00 Thermoplastic Membrane Roofing 07 54 16 Ketone Ethylene Ester Roofing
METHOD:	Method 1, Option C – Codified Material, Evaluation by Evaluation Entity
COMPLIANCE STATEMENT:	**Garland KEE-Stone HP Hybrid Roof Systems**, as produced by **The Garland Company, Inc.**, have demonstrated compliance with the Code sections noted herein through testing in accordance with the referenced Standards, rational analysis and an ongoing quality assurance program. Compliance is subject to the Installation Requirements and Limitations of Use set forth herein.
QUALITY ASSURANCE:	Evidence of current quality assurance shall be listing and labeling in accordance with the requirements of NEMO|cert.
CONTINUED COMPLIANCE:	This NER is valid until such time the named product(s) change, the referenced Quality Assurance changes, or the evaluated Code provisions change. NEMO Evaluations requires, at minimum, a complete review of this NER with each 3-year Code Cycle.
BUILDING PERMIT REQUIREMENTS:	As required by the Building Official or Authority Having Jurisdiction to evaluate the installation of this product.
ADVERTISEMENT:	"NEMO Evaluated" may be displayed in advertising literature. If any portion of the NER is displayed, it shall be displayed in its entirety.
CERTIFICATION OF INDEPENDENCE:	✓ NEMO CERT, LLC does not have, nor does it intend to acquire or will it acquire, a financial interest in any company manufacturing or distributing products it evaluates. ✓ NEMO CERT, LLC is not owned, operated or controlled by any company manufacturing or distributing products it evaluates. ✓ This is a building code evaluation. NEMO CERT, LLC is not, in any way, the Designer of Record for any project on which this NER, or previous versions thereof, is/was used for permitting or design guidance.

LINK TO TOP OF ATTACHMENT REQUIREMENTS

1. CODES, PROPERTIES AND STANDARDS:

CODE	SECTION	PROPERTY	STANDARD
2018 International Building Code	1504.3.1	Wind resistance	FM 4474, UL 1897
	1504.6	Physical properties	ASTM G154
	1504.7	Impact resistance	FM 4470
	1507.11.2	Material standard	ASTM D6162, D6163
	1507.13.2	Material standard	ASTM D6754
2024 International Building Code	104.2.3.6.1	Evaluation Reports	ISO/IEC 17065
	1504.4.1	Wind resistance	FM 4474, UL 1897
	1504.7	Impact resistance	FM 4470
	1507.11.2	Material standard	ASTM D6162, D6163
	1507.12.2	Material standard	ASTM D6754
2023 Florida Building Code, 8th Edition	1504.3.1	Wind resistance	FM 4474, UL 1897
	1504.6	Physical properties	ASTM G154
	1504.7	Impact resistance	FM 4470
	1507.11.2, TAS 110	Material standard	ASTM D6162, D6163
	1507.12.2, TAS 110	Material standard	ASTM D6754
	TAS 110	Resistance to Foot Traffic	TAS 114, Section 8.9
	TAS 110	Wind resistance	TAS 114, Appendix C, D or J
	TAS 110	Susceptibility to Hail Damage	TAS 114, Appendix F
	TAS 110	Susceptibility to Leakage	TAS 114, Appendix G
2022 California Building Code	Div. 5, Section 98.0501	Evaluation Reports	
2023 City of Los Angeles Building Code	1504.4.1	Wind resistance	FM 4474, UL 1897
2023 County of Los Angeles Building Code	1504.7	Impact resistance	FM 4470
	1507.11.2	Material standard	ASTM D6162, D6163
	1507.12.2	Material standard	ASTM D6754

2. PRODUCTS:

TABLE 1A: EVALUATED GARLAND MEMBRANES
(NEMO Certified. Consult Directory of Certified Products for production location(s))

TYPE	PRODUCT		MATERIAL STANDARD		
			REFERENCE	TYPE	GRADE
BASE PLY MEMBRANE	FlexBase 80		ASTM D6163	III	S
	FlexBase Plus 80		ASTM D6162	III	S
	FlexBase E 80		ASTM D6162	III	S
	HPR Torch Base Sheet		ASTM D6163	III	S
	StressBase 80		ASTM D6163	III	S
	StressBase 80 Plus		ASTM D6163	III	S
	StressBase 120		ASTM D6163	III	S
CAP PLY MEMBRANE	KEE-Stone® HP	60-mil	ASTM D6754	N/A	N/A

TABLE 2: COMPONENTS BY OTHERS (4.1.3)
(Refer to current NOA if listed version was superseded to ensure use of latest version)

TYPE	GARLAND PRODUCT	ACCEPTABLE ALTERNATE	FBC	NOA
ROOFING FASTENERS:	N/A	Dekfast DF-#15-PH3	FL20311	22-0913.02
	N/A	Dekfast PLT-2-7/8-H Plate		
	N/A	OMG XHD Fastener #15	FL699	24-0627.03
	N/A	OMG 3 in. Ribbed Galvalume Plate		
	N/A	OMG AccuTrac Flat Bottom Plate		
	N/A	Trufast #15 EHD	FL4500	24-0227.06
	N/A	Trufast 3” Metal Insulation Plate		
INSULATIONS:	WPG Polyiso	H-Shield	FL5968	24-0422.09
	WPG HD Polyiso	H-Shield HD		
	N/A	ACFoam II	FL17989	24-0215.03
	N/A	ENRGY 3®	FL4205	23-0509.05
	N/A	DensDeck Prime	FL1250	22-1223.04
	N/A	DEXcell® FA GlassMat Roof Board	FL17840	20-0212.01
	N/A	SECUROCK Gypsum-Fiber Roof Board	FL4264	21-0923.05
	N/A	Structodek HD with Primed Red Coating	FL13792	23-0623.03
ADHESIVES:	Insul-Lock® HR	Millennium One Step Foamable Adhesive	FL1800	21-1018.06
	KEE-Lock™ Spatter Spray	Millennium PG-1 EF ECO		
	GreenLock Plus Membrane Adhesive	N/A	FL2330	23-0118.05
PRIMERS:	SA Primer	N/A	N/A	N/A
VAPOR BARRIERS:	VaporSmart SA	N/A	N/A	24-0222.08

3. INSTALLATION:

3.1 **Garland KEE-Stone HP Hybrid Roof Systems** shall be installed in accordance with **The Garland Company, Inc.** published installation instructions, subject to the Limitations of Use noted herein.

3.1.1 Fasteners: Fasteners shall be of sufficient length for the following engagements.

TABLE 3: FASTENER REFERENCES

ROOF DECK	PARTS	FASTENER ENGAGEMENT
WOOD	Dekfast DF-#15-PH3 with Dekfast PLT-2-7/8-H Plate	Min. 0.75-inch penetration (engineered sheathing) or min. 1-inch embedment (plank)
	OMG XHD Fastener #15 with OMG 3 in. Ribbed Galvalume Plate or OMG AccuTrac Flat Bottom Plate	
	Trufast #15 EHD with Trufast 3" Metal Insulation Plate	
STEEL	Dekfast DF-#15-PH3 with Dekfast PLT-2-7/8-H Plate	Min. 0.75-inch penetration
	OMG XHD Fastener #15 with OMG 3 in. Ribbed Galvalume Plate or OMG AccuTrac Flat Bottom Plate	
	Trufast #15 EHD with Trufast 3" Metal Insulation Plate	

3.1.2 Insulation:

(a) Unless otherwise noted, insulation may be any one layer or combination of FBC Approved (Local or Statewide) board(s) that meet FBC 1505 and, for foam plastic, FBC Chapter 26, when installed with the roof cover.

(b) RESERVED

(c) Minimum 200 psi, minimum 2-inch thick FBC Approved (Local or Statewide) lightweight insulating concrete may be substituted for, or installed below, rigid insulation board for System Types B-1, C-1, C-2, D-1 or D-2, whereby fasteners are installed through the lightweight insulating concrete to engage the structural deck. The structural deck shall be of equal or greater type, thickness and strength to the steel and structural concrete deck listings. Roof decks and structural members shall be in accordance with FBC requirements to the satisfaction of the Authority Having Jurisdiction. This is a wind uplift resistance allowance and does not purport to address non-wind-uplift-related issues, such as deck venting or moisture levels within the LWIC and the potential effect on overlying components.

(d) RESERVED

(e) Unless otherwise noted, rigid board insulation or coverboard attachment patterns for Type B-1, B-2 and C-1 systems are as outlined below.

TABLE 4A: INSULATION ATTACHMENT PATTERNS – 4X4 FT BOARDS

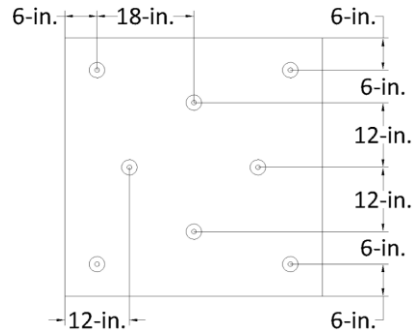
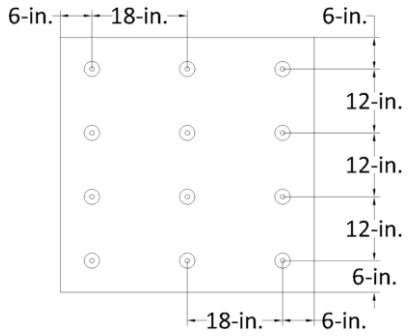
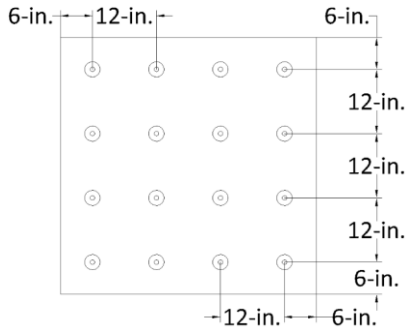
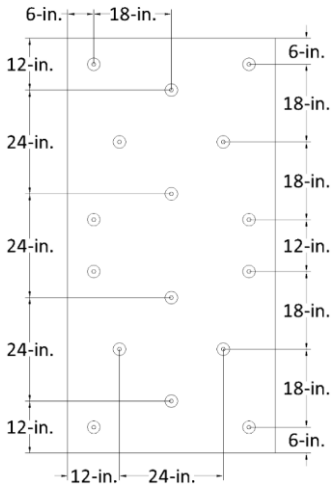
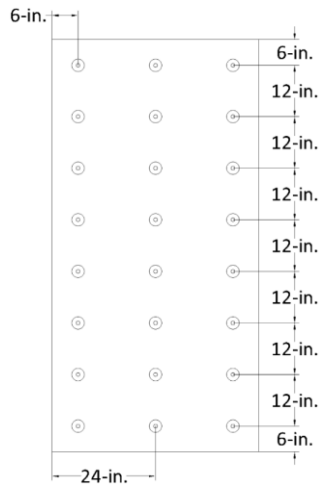
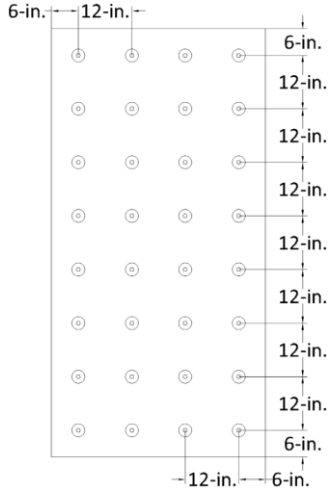
1 per 2.0 ft² (8 per board)	1 per 1.3 ft² (24 per board)	1 per 1.0 ft² (32 per board)
		

TABLE 4B: INSULATION ATTACHMENT PATTERNS – 4X8 FT BOARDS		
1 per 2.0 ft² (8 per board)	**1 per 1.3 ft² (24 per board)**	**1 per 1.0 ft² (32 per board)**
		

(f) RESERVED

3.1.3 Insulation Adhesives:

(a) Unless otherwise noted, insulation adhesive application rate is continuous ribbons, maximum 12-inch o.c. Ribbons shall be applied, and insulation boards shall be set in accordance with the manufacturer's published instructions. When multiple layers(s) of insulation and/or coverboard are installed in ribbon-applied adhesive, boards shall be staggered from layer-to-layer. The maximum edge distance from the adhesive ribbon to the edge of the insulation board shall be not less than one-half the specified ribbons spacing. Concrete deck shall be primed with ASTM D41 primer prior to asphalt-application.

TABLE 5: INSULATION ADHESIVE REFERENCES		
ADHESIVE	**REFERENCE**	**RATE**
Insul-Lock HR	ILHR	Continuous ribbons ½-inch wide ribbons, max. 12-inch o.c.
Hot asphalt		Full mopping, 25-30 lbs/square

(b) Unless otherwise noted, all adhered insulations are flat-stock or taper board of the minimum thickness noted. Tapered polyisocyanurate at the following thickness limitations may be substituted with the following Maximum Design Pressure (MDP) limitations. In no case shall these values be used to 'increase' the MDP listings in the tables; rather if MDP listing below meets or exceeds that listed for a particular system in the tables, then the thinner board listed below may be used as a drop-in for the equivalent thicker material listed in the selected assembly.

TABLE 6: MDP LIMITATIONS FOR TAPERED POLYISOCYANURATE INSULATIONS			
ADHESIVE	**INSULATION**	**MIN. TAPERED THICKNESS (IN)**	**MDP (PSF)**
ILHR	Any listed polyisocyanurate herein	0.5	-157.5

(c) Adhered Insulation, Board Size:

- Non-HVHZ: Unless otherwise noted, refer to Section 2.2.10.6.2 of FM Loss Prevention Data Sheet 1-29.
- HVHZ: Bonded polyisocyanurate insulation boards shall be maximum 4 x 4 ft.

3.1.4 Roof Covers:

(a) For bonded membrane applications, unless otherwise noted, refer to the following.

TABLE 7: MEMBRANE / ADHESIVE COMBINATIONS					
REFERENCE	LAYER	MATERIAL	APPLICATION		
			ADHESIVE	METHOD	RATE
KE-KLSS-SPRAY	Roof Cover or Cap Ply:	KEE-Stone HP	KEE-Lock Spatter Spray	Wet lay	"Spatter pattern" at 75% coverage
KE-AA	Roof Cover or Cap Ply:	KEE-Stone HP	Hot asphalt	Wet lay	20 to 25 lbs/square
SBS-CA3	Base Ply:	StressBase 80, StressBase 80 Plus, StressBase 120, FlexBase 80, FlexBase Plus 80 or FlexBase E 80	Green-Lock Plus Membrane Adhesive	Wet lay	2 to 2.5 gal./square
SBS-AA	Base Ply:	StressBase 80, StressBase 80 Plus, StressBase 120, FlexBase 80, FlexBase Plus 80 or FlexBase E 80	Hot asphalt	Wet lay	20 to 25 lbs/square
SBS-TA	Base Ply:	HPR Torch Base Sheet	Torch-Applied		

3.1.5 Vapor Barriers:

(a) For System Types B-1, B-2, C-1, C-2, D-1 or D-2, an optional thermal barrier and/or VaporSmart SA vapor barrier membrane may be installed atop the roof deck prior to installation of the insulation and roof cover. Refer to FM Loss Prevention Data Sheet 1-29 for design and installation recommendations and limitations.

(b) Refer to Section 4.3 herein for options where the vapor barrier forms part of the load path.

4. LIMITATIONS OF USE:

4.1 General:

4.1.1 This is a building code evaluation. NEMO CERT, LLC is not, in any way, the Designer of Record for any project on which this NER, or previous versions thereof, is/was used for permitting or design guidance. NERs are not to be construed as representing any attributes not specifically listed, nor are NERs to be construed as an endorsement of the subject of the report or a recommendation for its use. There is no warranty by NEMO CERT, LLC, express or implied, as to any finding or other matter in this report, or as to any product covered by the report.

4.1.2 Roof Decks:

(a) This NER pertains to above-deck roof components. Roof decks and structural members shall be in accordance with applicable Code requirements to the satisfaction of the Authority Having Jurisdiction.

(b) Unless otherwise noted, reference to 'structural concrete' pertains to min. 2,500 psi structural concrete.

(c) The table below lists various 'as-tested' deck conditions in accordance with Test Application Standard TAS 114(J). Steel deck stress analysis is the responsibility of others to the satisfaction of the Authority Having Jurisdiction.

AS-TESTED DECK ATTACHMENT DETAILS (TAS 114, APPENDIX J)				
TYPE	AS TESTED SUB-ASSEMBLY			
	SPAN (INCH O.C.)	FASTENER	SPACING (INCH O.C.)	MDP (PSF)
19/32-inch APA rated CDX plywood	24	8d ring shank nails	4	-150.0
Min. 22 ga., Type B, Grade 40 steel	72	#12 HWH Teks 5	6	-60.0
Min. 22 ga., Type B, Grade 33 steel	72	#12 HWH Teks 5	6	-135.0

4.1.3 Fire Classification:

(a) Refer to **IBC/FBC 1505, FBC HVHZ 1516,** UL TGFU.R8384 and the fire classification certificate for the roof cover manufacturer for requirements and limitations regarding roof assembly fire classification.

(b) Refer to **FBC 2603** for requirements and limitations concerning the use of foam plastic insulation.

4.1.4 Quality Assurance:

All components in the roof assembly shall have quality assurance surveillance in accordance with **F.A.C. Rule 61G20-3**. For components listed herein that are produced by a manufacturer other than the report holder on Page 1 of this NER, refer to the Florida Product Approval or NOA of the component manufacturer.

4.2 Jurisdiction Specific:

	FBC Non-HVHZ	FBC HVHZ
4.2.1	This NER does not include evaluation of roof edge termination. Refer to **FBC 1504.5** for requirements and limitations regarding edge securement for low-slope roofs.	This NER does not include evaluation of roof edge termination. Refer to **RAS 111** for requirements and limitations regarding edge securement for low-slope roofs.
4.2.2	Refer to **FBC 1511** for requirements and limitations regarding recover installations.	Refer to **FBC HVHZ 1521** for requirements and limitations regarding recover installations.
(a)	For mechanical attachment to existing roof decks, fasteners shall be tested for withdrawal resistance. A qualified design professional shall review the data for comparison to the minimum requirements for the system. Testing shall be in accordance with **ANSI/SPRI FX-1** or **TAS 105**.	For mechanical attachment to existing roof decks, fasteners shall be tested for withdrawal resistance. A qualified design professional shall review the data for comparison to the minimum requirements for the system. Testing shall be in accordance with **TAS 105**.
(b)	For adhered re-roof (tear off) installation, the existing substrate shall be examined for compatibility with the adhesive. If any surface conditions exist that bring system performance into question, field uplift testing in accordance with **ANSI/SPRI IA-1**, **FM Loss Prevention Data Sheet 1-52** or **TAS 124** shall be conducted on mock-ups of the proposed interface.	For adhered re-roof (tear off) installation, the existing substrate shall be examined for compatibility with the adhesive to be installed. If any surface conditions exist that bring system performance into question, field uplift testing in accordance with **TAS 124** shall be conducted on mock-ups of the proposed interface.
(c)	For adhered recover installation, the existing roof system shall meet project design pressure requirements on its own merit to the satisfaction of the Authority Having Jurisdiction, as documented through field uplift testing in accordance with **FM Loss Prevention Data Sheet 1-52** or **TAS 124**.	For adhered recover installation, the existing roof system shall meet project design pressure requirements on its own merit to the satisfaction of the Authority Having Jurisdiction, as documented through field uplift testing in accordance with **TAS 124**.
4.2.3	Wind Load Resistance:	
(a)	Refer to Section 4.3 for a tabulated summary of assembly listings and maximum allowable design pressures.	
(b)	"MDP" = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads, and reflects the ultimate passing pressure divided by 2 *(the 2 to 1 margin of safety per **FBC 1504.9** has already been applied)*. Refer to **FBC 1609** for determination of design wind loads.	"MDP" = Maximum Design Pressure is the result of testing for wind load resistance based on allowable wind loads, and reflects the ultimate passing pressure divided by 2 *(the 2 to 1 margin of safety per **TAS 114** has already been applied)*. Refer to **FBC HVHZ 1620** or **RAS 128** for determination of design wind loads.

FBC Non-HVHZ	FBC HVHZ
(c) The MDP for the selected assembly shall meet or exceed at least the Zone 1 PRIME design pressure determined in accordance with **FBC Chapter 16**. Elevated pressure zones shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria. Commonly used methods are ANSI/SPRI **WD1**, FM Loss Prevention Data Sheet **1-29**, RAS **117** and RAS **137**. Assemblies marked with an asterisk* carry the limitations set forth in **Section 2.2.10.1 of** FM Loss Prevention Data Sheet **1-29** for Zone 2/3 enhancements.	The MDP for the selected assembly shall meet or exceed at least the Zone 1 PRIME design pressure determined in accordance with **FBC HVHZ 1620** or RAS **128**. Elevated pressure zones shall employ an attachment density designed by a qualified design professional to resist the elevated pressure criteria. Analysis shall be in accordance with RAS **117** or RAS **137**.
(d) For fully-adhered installations, the maximum design pressure for the selected assembly shall meet or exceed the critical design pressure. Rational analysis is not permitted.	For assemblies marked with an asterisk*, the maximum design pressure (MDP) limitation shall be applicable to all roof pressure zones. Rational analysis is not permitted.

4.3 System Listings and Allowable Design Pressures: See Section 4.2.3

4.3.1 Thermal Barriers / Vapor Barriers: The lesser of the MDP listings below vs. that for the selected roof assembly from Section 4.3.2 applies.

(a) Steel Decks:

TABLE VB-1: STEEL DECK
THERMAL BARRIER / VAPOR BARRIER FOLLOWED BY ADHERED INSULATION

OPTION #	DECK (4.1.2)	THERMAL BARRIER			PRIMER	VAPOR BARRIER (3.1.4)	ADHESIVE PER TABLE 9A (3.1.3)	MDP (PSF)
		TYPE	FASTENER (4.2.2)	ATTACH (3.1.2)				
S-TB/VB-1.	Min. 22 ga., Type B, Grade 33 steel	Min. 0.5-inch DensDeck Prime or min. 0.625-inch DensDeck StormX Prime	OMG #12 Standard Roofgrip with OMG 3 in. Ribbed Galvalume Plate (Flat)	1 per 4.0 ft^2	SA Primer	VaporSmart SA	ILHR	-30.0*
S-TB/VB-2.	Min. 22 ga., Type B, Grade 33 steel	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	OMG #12 Standard Roofgrip with OMG 3 in. Ribbed Galvalume Plate (Flat)	1 per 4.0 ft^2	SA Primer	VaporSmart SA	ILHR	-45.0*

(b) Structural Concrete Decks:

TABLE VB-1: STRUCTURAL CONCRETE DECK
THERMAL BARRIER / VAPOR BARRIER FOLLOWED BY ADHERED INSULATION

OPTION #	DECK (4.1.2)	THERMAL BARRIER		PRIMER	VAPOR BARRIER (3.1.4)	ADHESIVE PER TABLE 9A (3.1.3)	MDP (PSF)
		TYPE	ADHESIVE (3.1.3)				
C-TB/VB-1.	Structural concrete	None	None	SA Primer	VaporSmart SA	ILHR	-67.5
C-TB/VB-2.	Structural concrete	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board, DensDeck Prime or min. 0.625-inch DensDeck Prime StormX	ILHR	SA Primer	VaporSmart SA	ILHR	-67.5

ATTACHMENT REQUIREMENTS FOR WIND UPLIFT RESISTANCE

TABLE	DECK	APPLICATION	TYPE	DESCRIPTION	PAGE
8A	Wood	New, Reroof (Tear-Off)	C-1	Mechanically Attached Insulation, Bonded Roof Cover	10
9A	Steel	New, Reroof (Tear-Off), Recover	B-1	Mechanically Attached Base Insulation, Bonded Top Insulation(s), Bonded Roof Cover	10
9B	Steel	New, Reroof (Tear-Off), Recover	C-1	Mechanically Attached Insulation, Bonded Roof Cover	12
10A	Structural concrete	New or Reroof (Tear-Off)	A-1	Bonded Insulation(s), Bonded Roof Cover	14

TABLE 8A: WOOD DECKS - NEW CONSTRUCTION, REROOF (TEAR-OFF)
SYSTEM TYPE C-1: MECHANICALLY ATTACHED INSULATION, BONDED ROOF COVER

SYSTEM NO.	DECK (4.1.2)	BASE INSULATION LAYER	TOP INSULATION LAYER			ROOF COVER (3.1.4)		MDP (PSF)
			TYPE	FASTENERS (3.1.1, 4.2.3)	ATTACH (3.1.2E)	BASE PLY	CAP PLY	
W-1	Min. 19/32-inch APA rated CDX plywood	(Optional) One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch DensDeck Prime, SECUROCK Gypsum-Fiber Roof Board, or DEXcell FA Glass Mat Roof Board	Section 3.1.1	1 per 1.0 ft^2	SBS-CA3	KE-KLSS-SPRAY	-150.0
W-2	Min. 19/32-inch APA rated CDX plywood	(Optional) One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch DensDeck Prime or DEXcell FA Glass Mat Roof Board	Trufast #15 EHD with Trufast 3" Metal Insulation Plates	1 per 1.0 ft^2	SBS-CA3	KE-KLSS-SPRAY	-150.0

TABLE 9A: STEEL OR STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (TEAR-OFF) OR RECOVER
SYSTEM TYPE B-1: MECHANICALLY ATTACHED BASE INSULATION, BONDED TOP INSULATION(S), BONDED ROOF COVER

SYSTEM NO.	DECK (4.1.2)	BASE INSULATION LAYER			TOP INSULATION LAYER		ROOF COVER (3.1.4)		MDP (PSF)
		TYPE	FASTENER (3.1.1, 4.2.3)	ATTACH (3.1.2E)	TYPE	ATTACH (3.1.3)	BASE PLY	CAP PLY	
S-1	Min. 22 ga., Type B, Grade 40 steel	Min. 1.5-inch WPG Polyiso, H-Shield, ACFoam II or ENRGY 3	Section 3.1.1	1 per 2.0 ft^2	Min. 0.5-inch Structodek HD with Primed Red Coating, DensDeck Prime, DEXcell FA Glass Mat Roof Board or SECUROCK Gypsum-Fiber Roof Board	ILHR	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-30.0 (NO HVHZ)
S-2	Min. 22 ga., type B, Grade 33 steel or structural concrete	Min. 2-inch ACFoam-II ISO 95+ GL or ENRGY 3	Section 3.1.1	1 per 2.0 ft^2	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	Hot asphalt or IL-HR	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-45.0*
S-3	Min. 22 ga., Type B, Grade 40 steel	Min. 1.5-inch WPG Polyiso or H-Shield	OMG XHD Fastener #15 with OMG 3 in. Ribbed Galvalume Plate or OMG AccuTrac Flat Bottom Plate or Trufast #15 EHD with Trufast 3" Metal Insulation Plate	1 per 2.0 ft^2	Min. 0.5-inch DensDeck Prime or SECUROCK Gypsum-Fiber Roof Board	ILHR	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-52.5

TABLE 9A: STEEL OR STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (TEAR-OFF) OR RECOVER
SYSTEM TYPE B-1: MECHANICALLY ATTACHED BASE INSULATION, BONDED TOP INSULATION(S), BONDED ROOF COVER

System No.	Deck (4.1.2)	Base Insulation Layer			Top Insulation Layer		Roof Cover (3.1.4)		MDP (PSF)
		Type	Fastener (3.1.1, 4.2.3)	Attach (3.1.2E)	Type	Attach (3.1.3)	Base Ply	Cap Ply	
S-4	Min. 22 ga., Type B, Grade 40 steel	Min. 1.5-inch WPG Polyiso, H-Shield, ACFoam II or ENRGY 3	Section 3.1.1	1 per 1.3 ft^2	Min. 0.5-inch DensDeck Prime, DEXcell FA Glass Mat Roof Board or SECUROCK Gypsum-Fiber Roof Board	ILHR	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-60.0
S-5	Min. 22 ga., Type B, Grade 33 steel or structural concrete	Min. 2-inch ACFoam II, ENRGY 3, WPG Polyiso or H-Shield	Section 3.1.1	1 per 4.0 ft^2	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR	SBS-AA, or SBS-TA	KE-KLSS-SPRAY or KE-AA	-37.5* (NO HVHZ)
S-6	Min. 22 ga., Type B, Grade 33 steel or structural concrete	Min. 1.8-inch ACFoam-II ISO 95+ GL or ENRGY 3	Section 3.1.1	1 per 2.9 ft^2	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	Hot asphalt	SBS-AA	KE-KLSS-SPRAY or KE-AA	-45.0*
S-7	Min. 22 ga., Type B, Grade 33 steel or structural concrete	Min. 1.5-inch ACFoam-II, ENRGY 3, WPG Polyiso or H-Shield	Section 3.1.1	1 per 2.0 ft^2	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-45.0*
S-8	Min. 22 ga., Type B, Grade 33 steel or structural concrete	Min. 2-inch ACFoam-II, ENRGY 3, WPG Polyiso or H-Shield	Section 3.1.1	1 per 1.6 ft^2	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-60.0
S-9	Min. 22 ga., Type B, Grade 33 steel or structural concrete	Min. 1.5-inch ACFoam-II	OMG Heavy Duty with OMG 3 in. Galv. Steel Plate	1 per 1.3 ft^2	Min. 0.5-inch GP High Density Roof Fiberboard or Structodek High Density Fiberboard Roof Insulation	Hot asphalt	SBS-AA	KE-KLSS-SPRAY or KE-AA	-82.5
S-10	Min. 22 ga., Type B, Grade 33 steel or structural concrete	Min. 1.5-inch ACFoam-ii	OMG Heavy Duty with OMG 3 in. Galv. Steel Plate	1 per 1.3 ft^2	Min. 0.5-inch DensDeck or DensDeck Prime	Hot asphalt	SBS-TA	KE-KLSS-SPRAY or KE-AA	-82.5
S-11	Min. 22 ga., Type B, Grade 33 steel or structural concrete	Min. 2.0-inch ACFoam-II, H-Shield, WPG Polyiso, or ENRGY 3	Section 3.1.1	1 per 1.0 ft^2	Min. 0.5-inch DensDeck Prime	Hot asphalt	SBS-TA	KE-KLSS-SPRAY or KE-AA	-82.5
S-12	Min. 22 ga., type B, Grade 40 steel	Min. 1.5-inch WPG Polyiso or H-Shield	OMG XHD with OMG 3 in. Ribbed Galv. Steel Plate (Flat)	1 per 2.0 ft^2	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-45.0
S-13	Min. 22 ga., type B, Grade 40 steel	Min. 1.5-inch ENRGY 3	Section 3.1.1	1 per 1.33 ft^2	Min. 0.5-inch DensDeck Prime, SECUROCK Gypsum-Fiber Roof Board, or DEXcell FA Glass Mat Roof Board	IL-HR, 6-inch o.c.	SBS-CA3	KE-KLSS-SPRAY	-82.5

TABLE 9B: STEEL DECKS OR STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (TEAR-OFF) OR RECOVER
SYSTEM TYPE C-1: MECHANICALLY ATTACHED INSULATION, BONDED ROOF COVER

SYSTEM NO.	DECK (4.1.2)	BASE INSULATION LAYER	TOP INSULATION LAYER			ROOF COVER (3.1.4)		MDP (PSF)
			TYPE	FASTENERS (3.1.1, 4.2.3)	ATTACH (3.1.2E)	BASE PLY	CAP PLY	
S-14	Min. 22 ga., 33 ksi steel	Min. 1.5-inch WPG Polyiso, H-Shield, ACFoam II or ENRGY 3	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	TruFast #14 HD Fasteners with TruFast 3" Metal Insulation Plates	1 per 1.0 ft^2	SBS-AA	KE-KLSS-SPRAY	-67.5
S-15	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	OMG #12 Standard Hex Head or OMG Heavy Duty with OMG 3 in. Galv Steel	1 per 3.2 ft^2	SBS-AA	KE-KLSS-SPRAY or KE-AA	-30.0* (NO HVHZ)
S-16	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 0.5-inch DensDeck or SECUROCK Gypsum-Fiber Roof Board	Section 3.1.1	1 per 2.7 ft^2	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-45.0*
S-17	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	Section 3.1.1	1 per 2.9 ft^2	SBS-AA	KE-KLSS-SPRAY or KE-AA	-45.0*
S-18	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional)One or more layers, any combination, loose laid	Min. 0.5-inch DensDeck or DensDeck Prime	Section 3.1.1	1 per 2.9 ft^2	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-45.0*
S-19	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional)One or more layers, any combination, loose laid	Min. 1-inch Structodek High Density Fiberboard Roof Insulation	Section 3.1.1	1 per 2.0 ft^2	SBS-AA	KE-KLSS-SPRAY or KE-AA	-60.0
S-20	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional)One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Section 3.1.1	1 per 1.3 ft^2	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-75.0
S-21	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional)One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch DensDeck Prime	Trufast 3" Metal Insulation Plates with Trufast #14 HD	1 per 1.3 ft^2	SBS-AA	KE-KLSS-SPRAY or KE-AA	-82.5
S-22	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional)One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board; Note: coverboard & plates primed with D41 primer	OMG XHD with OMG 3 in. Galvalume Steel Plate	1 per 1.0 ft^2	SBS-AA	KE-KLSS-SPRAY or KE-AA	-82.5
S-23	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional)One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch DensDeck Prime	Section 3.1.1	1 per 1.0 ft^2	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-82.5

TABLE 9B: STEEL DECKS OR STRUCTURAL CONCRETE DECKS - NEW CONSTRUCTION, REROOF (TEAR-OFF) OR RECOVER
SYSTEM TYPE C-1: MECHANICALLY ATTACHED INSULATION, BONDED ROOF COVER

SYSTEM NO.	DECK (4.1.2)	BASE INSULATION LAYER	TOP INSULATION LAYER			ROOF COVER (3.1.4)		MDP (PSF)
			TYPE	FASTENERS (3.1.1, 4.2.3)	ATTACH (3.1.2E)	BASE PLY	CAP PLY	
S-24	Min. 22 ga., Type B, Grade 33 steel or structural concrete	(Optional)One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Trufast 3" Metal Insulation Plates with Trufast #14 HD	1 per 1.0 ft^2	SBS-AA	KE-KLSS-SPRAY or KE-AA	-82.5
S-25	Min. 22 ga., type B, Grade 33 steel or structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	Section 3.1.1	1 per 2.7 ft^2	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-37.5* (NO HVHZ)
S-26	Min. 22 ga., type B, Grade 33 steel or structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 1.5-inch ACFoam-II	OMG #12 Standard Hex Head or OMG Heavy Duty with OMG 3 in. Galv. Steel	1 per 2.0 ft^2	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-45.0*
S-27	Min. 22 ga., type B, Grade 33 steel or structural concrete	(Optional) One or more layers, any combination, loose laid	Min. 0.5-inch DensDeck or SECUROCK Gypsum-Fiber Roof Board	Section 3.1.1	1 per 2.7 ft^2	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-45.0*
S-28	Min. 22 ga., type B, Grade 33 steel or structural concrete	(Optional)One or more layers, any combination, loose laid	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation or DensDeck Prime	Section 3.1.1	1 per 2.0 ft^2	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-45.0*
S-29	Min. 22 ga., type B, Grade 33 steel or structural concrete	(Optional)One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Section 3.1.1	1 per 1.3 ft^2	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-75.0
S-30	Min. 22 ga., type B, Grade 33 steel or structural concrete	(Optional) One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch DensDeck Prime	Section 3.1.1	1 per 1.0 ft2	SBS-CA3	KE-KLSS-SPRAY	-150.0
S-31	Min. 22 ga., type B, Grade 33 steel or structural concrete	(Optional) One or more layers, min. 1.5-inch, any combination, loose laid	Min. 0.5-inch DensDeck Prime, SECUROCK Gypsum-Fiber Roof Board, or DEXcell FA Glass Mat Roof Board	Trufast #15 EHD with Trufast 3" Metal Insulation Plates	1 per 1.0 ft2	SBS-CA3	KE-KLSS-SPRAY	-150.0

TABLE 10A: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION OR REROOF (TEAR-OFF)
SYSTEM TYPE A-1: BONDED INSULATION(S), BONDED ROOF COVER
REFER TO TABLE VB-2 FOR VAPOR BARRIER OPTIONS

System No.	Deck (4.1.2)	Primer	Base Insulation Layer		Top Insulation Layer		Roof Cover (3.1.4)		MDP (psf)
			Type	Attach (3.1.3)	Type	Attach (3.1.3)	Base Ply	Cap Ply	
C-1	Structural concrete	None	Min. 1.5-inch WPG Polyiso, H-Shield, ACFoam II or ENRGY 3	ILHR	Min. 0.5-inch Structodek HD with Primed Red Coating	ILHR	SBS-CA3	KE-KLSS-SPRAY	-102.5
C-2	Structural concrete	None	Min. 1.5-inch WPG Polyiso, H-Shield, ACFoam II or ENRGY 3	ILHR	Min. 0.5-inch DEXcell FA Glass Mat Roof Board	ILHR	SBS-CA3	KE-KLSS-SPRAY	-155.0
C-3	Structural concrete	None	Min. 1.5-inch WPG Polyiso, H-Shield, ACFoam II or ENRGY 3	ILHR	Min. 0.5-inch DensDeck Prime or SECUROCK Gypsum-Fiber Roof Board	ILHR	SBS-CA3	KE-KLSS-SPRAY	-275.0
C-4	Structural concrete	ASTM D41	Min. 1.5-inch ACFoam-II, WPG Polyiso, H-Shield, ENRGY 3 or Multi-Max FA3	Hot asphalt	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	Hot asphalt	SBS-AA	KE-KLSS-SPRAY or KE-AA	-157.5
C-5	Structural concrete	ASTM D41	Min. 1.5-inch ACFoam-II, WPG Polyiso, H-Shield or Multi-Max FA3	Hot asphalt	Min. 0.5-inch DensDeck or DensDeck Prime	Hot asphalt	SBS-TA	KE-KLSS-SPRAY or KE-AA	-157.5
C-6	Structural concrete	ASTM D41	Min. 1.5-inch ENRGY 3	Hot asphalt	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	Hot asphalt	SBS-AA	KE-KLSS-SPRAY or KE-AA	-165.0
C-7	Structural concrete	ASTM D41	Min. 1.5-inch ENRGY 3	Hot asphalt	Min. 0.5-inch DensDeck or DensDeck Prime	Hot asphalt	SBS-TA	KE-KLSS-SPRAY or KE-AA	-165.0
C-8	Structural concrete	ASTM D41	Min. 1.5-inch ACFoam-II	Hot asphalt	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	Hot asphalt	SBS-AA	KE-KLSS-SPRAY or KE-AA	-165.0
C-9	Structural concrete	ASTM D41	Min. 1.5-inch WPG Polyiso or H-Shield	Hot asphalt	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Hot asphalt	SBS-TA	KE-KLSS-SPRAY or KE-AA	-165.0
C-10	Structural concrete	None	Min. 1.5-inch ACFoam-II, WPG Polyiso, H-Shield, ENRGY 3 or Multi-Max FA3	IL-HR	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	IL-HR	SBS-AA	KE-KLSS-SPRAY or KE-AA	-127.5
C-11	Structural concrete	None	Min. 1.5-inch ACFoam-II, WPG Polyiso, H-Shield, ENRGY 3 or Multi-Max FA3	IL-HR	Min. 0.5-inch DensDeck Prime	IL-HR	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-165.0
C-12	Structural concrete	None	Min. 2-inch ACFoam-II, WPG Polyiso, H-Shield or ENRGY 3	IL-HR	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-165.0
C-13	Structural concrete	None	Min. 1.5-inch ACFoam-II, WPG Polyiso, H-Shield, ENRGY 3 or Multi-Max FA3	IL-HR	Min. 0.5-inch SECRUOCK Gypsum-Fiber Roof Board	IL-HR	SBS-AA	KE-KLSS-SPRAY or KE-AA	-165.0
C-14	Structural concrete	None	Min. 1.5-inch WPG Polyiso	IL-HR, 6-inch o.c.	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR, 6-inch o.c.	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-165.0
C-15	Structural concrete	None	Min. 0.25-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR, 3-inch o.c.	None	N/A	SBS-AA or SBS-TA	KE-KLSS-SPRAY or KE-AA	-165.0
C-16	Structural concrete	ASTM D41	Min. 1.5-inch WPG Polyiso or H-Shield	Hot asphalt	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	Hot asphalt	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-150.0
C-17	Structural concrete	ASTM D41	Min. 0.5-inch Structodek High Density Fiberboard Roof Insulation	Hot asphalt	None	N/A	SBS-CA2	KE-KLSS-SPRAY or KE-AA	-165.0

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TABLE 10A: STRUCTURAL CONCRETE DECKS – NEW CONSTRUCTION OR REROOF (TEAR-OFF)
SYSTEM TYPE A-1: BONDED INSULATION(S), BONDED ROOF COVER
REFER TO TABLE VB-2 FOR VAPOR BARRIER OPTIONS

SYSTEM NO.	DECK (4.1.2)	PRIMER	BASE INSULATION LAYER		TOP INSULATION LAYER		ROOF COVER (3.1.4)		MDP (PSF)
			TYPE	ATTACH (3.1.3)	TYPE	ATTACH (3.1.3)	BASE PLY	CAP PLY	
C-18	Structural concrete	None	Min. 1.5-inch ACFoam-II	IL-HR	(Optional) One or more layers base insulation	IL-HR	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-75.0
C-19	Structural concrete	None	Min. 2-inch ACFoam-II, WPG Polyiso, H-Shield or ENRGY 3	IL-HR	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-165.0
C-20	Structural concrete	None	Min. 2-inch ENRGY 3 or Multi-Max FA3	IL-HR, 8-inch o.c.	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board or DensDeck Prime	IL-HR, 8-inch o.c.	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-165.0
C-21	Structural concrete	None	Min. 1.5-inch ACFoam-II, WPG Polyiso, H-Shield, ENRGY 3 or Multi-Max FA3	IL-HR	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-165.0
C-22	Structural concrete	None	Min. 1.5-inch WPG Polyiso or H-Shield	IL-HR, 6-inch o.c.	Min. 0.5-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR, 6-inch o.c.	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-165.0
C-23	Structural concrete	None	Min. 0.25-inch SECUROCK Gypsum-Fiber Roof Board	IL-HR, 3-inch o.c.	None	N/A	SBS-CA3	KE-KLSS-SPRAY or KE-AA	-165.0
C-24	Structural concrete	None	Min. 0.25-inch DensDeck Prime	IL-HR	Min. 0.5-inch DensDeck Prime, SECUROCK Gypsum-Fiber Roof Board, or DEXcell FA Glass Mat Roof Board	IL-HR	SBS-CA3	KE-KLSS-SPRAY	-92.5
C-25	Structural concrete	None	Min. 1.5-inch WPG Polyiso or H-Shield	IL-HR, 6-inch o.c.	Min. 0.5-inch Structodek High Density Fiberboard with Primed Red Coating	IL-HR, 6-inch o.c.	SBS-CA3	KE-KLSS-SPRAY	-70.0
C-26	Structural concrete	None	Min. 1.5-inch WPG Polyiso or H-Shield	IL-HR, 6-inch o.c.	Min. 0.5-inch DensDeck Prime, SECUROCK Gypsum-Fiber Roof Board, or DEXcell FA Glass Mat Roof Board	IL-HR, 6-inch o.c.	SBS-CA3	KE-KLSS-SPRAY	-257.5