MS ROOF ANCHOR, LLC
6 Via Monarca Street
Dana Point, California 92629
949-636-1255
mark@msroofanchor.com
www.msroofanchor.com

MS ROOF ANCHOR

CSI Sections:
05 50 00 Metal Fabrications
06 05 23 Wood, Plastic, and Composite Fastenings

1.0 RECOGNITION

The MS Roof Anchor, LLC, MS Roof Anchor recognized in this report has been evaluated for use as a roof-level anchoring device. The structural and durability properties of the MS Roof Anchor comply with the intent of the provisions of the following codes and regulations:

- 2021, 2018, and 2015 International Building Code® (IBC)
- 2022 California Building Code (CBC) – Attached Supplement
- 2023 Florida Building Code, Building, 8th Edition (FBC, Building) – Attached Supplement
- 2023 Los Angeles Building Code (LABC) – Attached Supplement

2.0 LIMITATIONS

Use of the MS Roof Anchor recognized in this report is subject to the following limitations:

2.1 The MS Roof Anchor shall be manufactured, identified, and installed in accordance with the manufacturer's published installation instructions and this report. A copy of the instructions shall be available at the job site continuously during installation. If there is a conflict between this report and the manufacturer's published installation instructions, the more restrictive prevails.

2.2 Construction Documents, including calculations showing compliance with IBC Sections 107 and 1603, and this report shall be submitted to the building official. The calculations shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

2.3 The MS Roof Anchor shall be designed for installation on a specific building roof framing system by a registered design professional and approved by the building official.

2.4 Connected wood members and fasteners shall comply with Sections 4.2.2 and 4.2.3 of this report, respectively.

2.5 The MS Roof Anchor shall not be used simultaneously for two different setups.

2.6 Use of the MS Roof Anchor with fire-retardant-treated or preservative-treated lumber shall be in accordance with Section 4.2.1 of this report. The use of fasteners with fire-retardant-treated or preservative-treated lumber shall be in accordance with Section 4.2.3 of this report.

2.7 The MS Roof Anchor devices are fabricated in Santa Ana, California.

3.0 PRODUCT USE

3.1 MS Roof Anchor

3.1.1 General: The MS Roof Anchors are for securing Mechanical Screens, Solar Canopies and Mounting Structures, Roof Trellises, Privacy Screens, HVAC Units, Signage, or any other structure to rooftops, decks, or balconies. The device is fastened to wood members using screws placed through the device holes into the supporting structure.

3.1.2 Design: The MS Roof Anchor is intended to support rooftop, deck, and balcony Mechanical Screens, Solar Canopies and Mounting Structures, Roof Trellises, Privacy Screens, HVAC Units, Signage, and any other structure against transverse pressures due to wind or earthquake, both parallel and perpendicular to the horizontal wood members. Table 1 of this report provides the fastening schedule for wood members. The allowable stress design (ASD) and Load and Resistance Factor Design (LRFD) lateral shear and Moment capacities are provided in Table 2 of this report. Wood members are beyond the scope of this report and shall be designed to resist the effects of lateral and gravity loadings from the MS Roof Anchor and connected structure. The weight of the MS Roof Anchor and the supported roof structure shall be considered a dead load. The structural analysis shall establish a complete load path due to the load effects of the MS Roof Anchor in accordance with IBC Section 1604.4.

3.1.2.2 Transverse Pressure Resistance: Tables 3 and 4 of this report provide a schedule for structure size, anchor sizing, and resulting ASD and LRFD lateral transverse pressure strengths. Required loads shall be determined by the design professional in accordance with the IBC and

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11. This document shall only be reproduced in its entirety.

Produced by International Association of Plumbing and Mechanical Officials. All rights reserved. Printed in the United States. Ph: 1-877-4IESRPT • Fax: 909.472.4171 web: www.uniform-es.org • 4755 East Philadelphia Street, Ontario, California 91761-2816 – USA

ASCE/SEI 7, as applicable. Wind loads shall comply with ASCE/SEI Chapter 29. The Roof structure and Connections to the screen are beyond the scope of this report and shall be justified to the satisfaction of the building official.

3.1.3 Installation:

3.1.3.1 General: The MS Roof Anchor shall be installed in accordance with this report, the IBC, and the manufacturer's installation instructions. Where conflicts occur, the more restrictive shall govern. Installation shall be performed only by qualified installers approved by MS Roof Anchor, LLC. Requirements in IBC Section 1511 shall apply where applicable. The MS Roof Anchor is available with post heights as follows:

- RAS-35-4 – 48 inches
- RAL-55-8 – 96 inches

The installation requirements for intermediate post heights shall be based on the next highest post height shown in Tables 3 and 4 of this report. The post may be cut in the field to the appropriate height. Custom heights exceeding 48 inches for the RAS-35-4 and 96 inches for the RAL-55-8 may be designed by the design professional using the maximum allowable loading shown in Table 2 of this report.

On special orders and post heights exceeding the standard height, the last number in the product name shall be adjusted according to the height based on equivalent feet.

Examples:
- 60-inch post on a RAS base – RAS-35-5
- 66-inch post on a RAS base – RAS-35-5.5
- 87-inch post on a RAL base – RAL-55-7.25
- 102-inch post on a RAL base – RAL-55-8.5

3.1.3.2 Existing Construction: Existing wood framing and decking shall be repaired or replaced if damaged. Where portions of the roofing are altered to allow the MS Roof Anchor installation, these areas shall be repaired.

Wood species and grade shall be verified as complying with provisions in Section 4.2.2 and Table 1 of this report.

3.1.3.3 Fastening: The MS Roof Anchor shall be fastened by screws directly to the supporting wood framing. Table 1 of this report provides fastening to the wood framing schedule. Fastener types and sizes shall be as follows:

- ¼ inch diameter by 2½ inch long SDS Screws shall be used on solid supporting members.
- ¼ inch diameter by 3-inch long SDS Screws shall be used with assembled supporting members as shown in Detail 2 (MS Roof Anchor On 5¼" EWP Beam w/Filler), Figure 1 of this report (MS Roof Anchor Beam Details Sheet) and when attached directly to assembled trusses as shown in Details 2, 3, and 4, Figure 2 of this report (MS Roof Anchor Truss Detail Sheet).

Fastener installation shall conform to Section 11.1 of the ANSI/AWC National Design Specification for Wood Construction (ANSI/AWC NDS) and the evaluation report for the fastener.

4.0 PRODUCT DESCRIPTION

4.1 General: The MS Roof Anchor described in this report is available in two different types.

4.1.1 RAS-35-4: The RAS-35-4 MS Roof Anchor device consists of a Square HSS2x2x¼ by 48-inch-high post welded to ½ inch thick plate steel base plate, which is filet-welded to ¼ inch thick steel skirts. Each skirt has $^{5}/_{16}$-inch diameter holes to receive screws.

4.1.2 RAL-55-8: The RAL-55-8 MS Roof Anchor device consists of a Square HSS3x3x⅜ by 96-inch-high post welded to ½ inch thick plate steel base plate, which is filet-welded to ¼ inch thick steel skirts. Each skirt has $^{5}/_{16}$-inch diameter holes to receive screws.

4.2 Materials:

4.2.1 Steel: The Square HSS posts are produced from steel complying with ASTM A500 Grade B.

The skirts are manufactured from plain steel plates complying with ASTM A572 Grade 50.

Welds are produced using E70XX electrodes complying with the applicable AWS standard for the welding process.

The entire MS Roof Anchors shall be provided with a paint system.

The holder of this report (MS Roof Anchor, LLC) or lumber treater shall be contacted for recommendations on minimum corrosion resistance of steel in contact with specific proprietary preservative-treated or fire-retardant-treated lumber.

4.2.2 Wood: Wood members to which the MS Roof Anchor is connected shall be either sawn lumber or engineered lumber complying with ANSI/AWC National Design Specification for Wood Construction and its Supplement (ANSI/AWC NDS). Sawn lumber shall have a minimum 0.50 specific gravity and engineered lumber shall be of equivalent specific gravity. The thickness (depth) of the wood main member shall be equal to or greater than the length of the fasteners specified by the calculations unless the reduced

penetration effect on the load calculation in accordance with the ANSI/AWC NDS is considered, or as required by the wood member design, whichever is greater.

Wood Member Minimum Depth:
RAS – 6-inches
RAL – 8.5-inches

Wood Member Minimum Width:
RAS – 3.5-inches
RAL – 5.5-inches

Wood Member Maximum Width:
RAS – 12-inches
RAL – 12-inches

Multiple wood members may be connected to achieve the minimum width. The attachment of multiple wood members shall be designed by the design professional for the project and consider the loaded members and loading direction.

4.2.3 Fasteners: SDS screws shall comply with ICC-ES ESR-2236. Fasteners used in contact with fire-retardant-treated or preservative-treated lumber shall comply with 2021 IBC Section 2304.10.6, or 2018 or 2015 IBC Section 2304.10.5, as applicable. The report holder (MS Roof Anchor, LLC) or lumber treater shall be contacted for recommendations on minimum corrosion resistance and connection capacities of fasteners used with the specific proprietary preservative-treated or fire-retardant-treated lumber.

5.0 IDENTIFICATION

The MS Roof Anchor is identified by the MS Roof Anchor, LLC name and trademark, product name, the number of screws, and the evaluation report number (IAPMO UES ER-928). The IAPMO Uniform Evaluation Service (UES) Mark of Conformity may also be used as shown below:

IAPMO UES ER-928

SUBSTANTIATING DATA

6.1 Manufacturer's descriptive literature and installation instructions.

6.2 Engineering calculations.

6.3 Quality documentation.

7.0 STATEMENT OF RECOGNITION

This evaluation report describes the results of research completed by IAPMO Uniform Evaluation Service on the MS Roof Anchor to assess conformance to the codes shown in Section 1.0 of this report and documents the product's certification. Products are manufactured at the location noted in Section 2.7 of this report under a quality control program with periodic inspections under the surveillance of IAPMO UES.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org

TABLE 1 – MS ROOF ANCHOR FASTENING REQUIREMENTS[1]

Device	Fastener	Fastener Diameter (inch)	Fastener Length[4,5]	No. of Fasteners per opposing skirt (total)	Minimum wood member size (nominal)	Minimum Lumber Specific Gravity	Minimum Edge Distance (inch)[2]	Minimum End Distance (inch)[2,3]	
								⊥	∥
RAS-35-4	SDS Screw	0.25	2.5	10 (20)	4 by 8	0.50	1½	3	4
RAL-55-8	SDS Screw	0.25	2.5	20 (40)	6 by 10	0.50	1½	3	4

1. The MS Roof Anchor shall be placed over structural framing and fastened to the framing through the skirts. Wood blocking shall be installed perpendicular to the structural framing adjacent to the device.
2. Edge distances and end distances may need to be increased, as applicable, to prevent wood splitting.
3. The end distance is for loading perpendicular to grain (⊥) or parallel to grain (∥).
4. The ¼ inch diameter by 2 ½ inch long SDS Screws shall be used on solid supporting members.
5. The ¼ inch diameter by 3" SDS Screws shall be used with assembled supporting members as shown in Detail 2 (MS Roof Anchor On 5 ¼" EWP Beam w/Filler), Figure 1 of this report (MS Roof Anchor Bream Details Sheet) and when attached directly to assembled trusses as shown in Details 2, 3, and 4, Figure 2 of this report (MS Roof Anchor Truss Detail Sheet).

TABLE 2 – MAXIMUM ALLOWABLE LOADING OF ROOF ANCHOR[1,2]

MODEL	STRENGTH CONDITION	ASD LEVEL	STRENGTH LEVEL
RAS-35-4	Available Strength in Shear, P (lbs)	6,650	10,639
	Available Strength in Bending, M (lb-ft)	1,939	3,193
RAL-55-8	Available Strength in Shear, P (lbs)	13,324	21,318
	Available Strength in Bending, M (lb-ft)	6,107	9,771

[1] The tabulated available strength shall equal or exceed the required strength as determined by analysis.
[2] Custom heights exceeding 48 inches for the RAS-35-4 and 96 inches for the RAL-55-8 may be designed by the design professional using the maximum allowable loading shown in the Table.

TABLE 3 – RAS-35-4 MS ROOF ANCHOR ASD AND LRFD UNIFORM TRANSVERSE PRESSURES[1,2]

MAXIMUM ALLOWABLE POST HEIGHT (H) (ft.)	RAS-35-4 SPACING (S) (ft.)	RAS-35-4 TRIBUTARY AREA (A) (sq. ft.)	UNIFORM TRANSVERSE PRESSURE (P) (psf)	
			ASD LEVEL AVAILABLE STRENGTH	LRFD (STRENGTH) LEVEL AVAILABLE STRENGTH
4.00	2.00	8.00	121	194
4.00	4.00	16.00	61	97
4.00	6.00	24.00	40	65
4.00	8.00	32.00	30	48
4.00	10.00	40.00	24	39
4.00	11.00	44.00	22	35
4.00	12.00	48.00	20	32

[1] The table is intended to assist with the preliminary design if the assumed installation conditions match project conditions. The final design shall verify that the tabulated available strength equals or exceeds the required strength as determined by analysis.
[2] The top of the attached structure shall be no higher than the top of the post unless specifically designed by the design professional and approved by the building official.

TABLE 4 – RAL-55-8 MS ROOF ANCHOR ASD AND LRFD UNIFORM TRANSVERSE PRESSURES[1,2]

MAXIMUM ALLOWABLE POST HEIGHT (H) (ft.)	RAL-55-8 SPACING (S) (ft.)	RAL-55-8 TRIBUTARY AREA (A) (sq. ft.)	UNIFORM TRANSVERSE PRESSURE (P) (psf)	
			ASD LEVEL AVAILABLE STRENGTH	LRFD (STRENGTH) LEVEL AVAILABLE STRENGTH
4.00	2.00	8.00	382	611
4.00	4.00	16.00	191	305
4.00	6.00	24.00	127	204
4.00	8.00	32.00	95	153
4.00	10.00	40.00	76	122
4.00	11.00	44.00	69	111
4.00	12.00	48.00	64	102
5.00	2.00	10.00.	244	391
5.00	4.00	20.00	122	195
5.00	6.00	30.00.	81	130
5.00	8.00	40.00	61	98
5.00	10.00	50.00	49	78
5.00	11.00	55.00	44	71
5.00	12.00	60.00	41	65
6.00	2.00	12.00	170	271
6.00	4.00	24.00	85	136
6.00	6.00	36.00	57	90
6.00	8.00	48.00.	42	68
6.00	10.00	60.00	34	54
6.00	11.00	66.00	31	49
6.00	12.00	72.00	28	45
7.00	2.00	14.00	125	199
7.00	4.00	28.00	62	100
7.00	6.00	42.00	42	66
7.00	8.00	56.00	31	50
7.00	10.00	70.00	25	40
7.00	11.00	77.00	23	36
7.00	12.00	84.00	21	33
8.00	2.00	16.00	95	153
8.00	4.00	32.00	48	76
8.00	6.00	48.00	32	51
8.00	8.00	64.00	24	38
8.00	10.00	80.00	19	31
8.00	11.00	88.00	Not Permitted	Not Permitted
8.00	12.00	96.00	Not Permitted	Not Permitted

[1] The table is intended to assist with the preliminary design if the assumed installation conditions match project conditions. The final design shall verify that the tabulated available strength equals or exceeds the required strength as determined by analysis.

[2] The top of the attached structure shall not be above the top of the post unless specifically designed by the design professional and approved by the building official.

Figure 1 – MS Roof Anchor Beam Detail Sheet

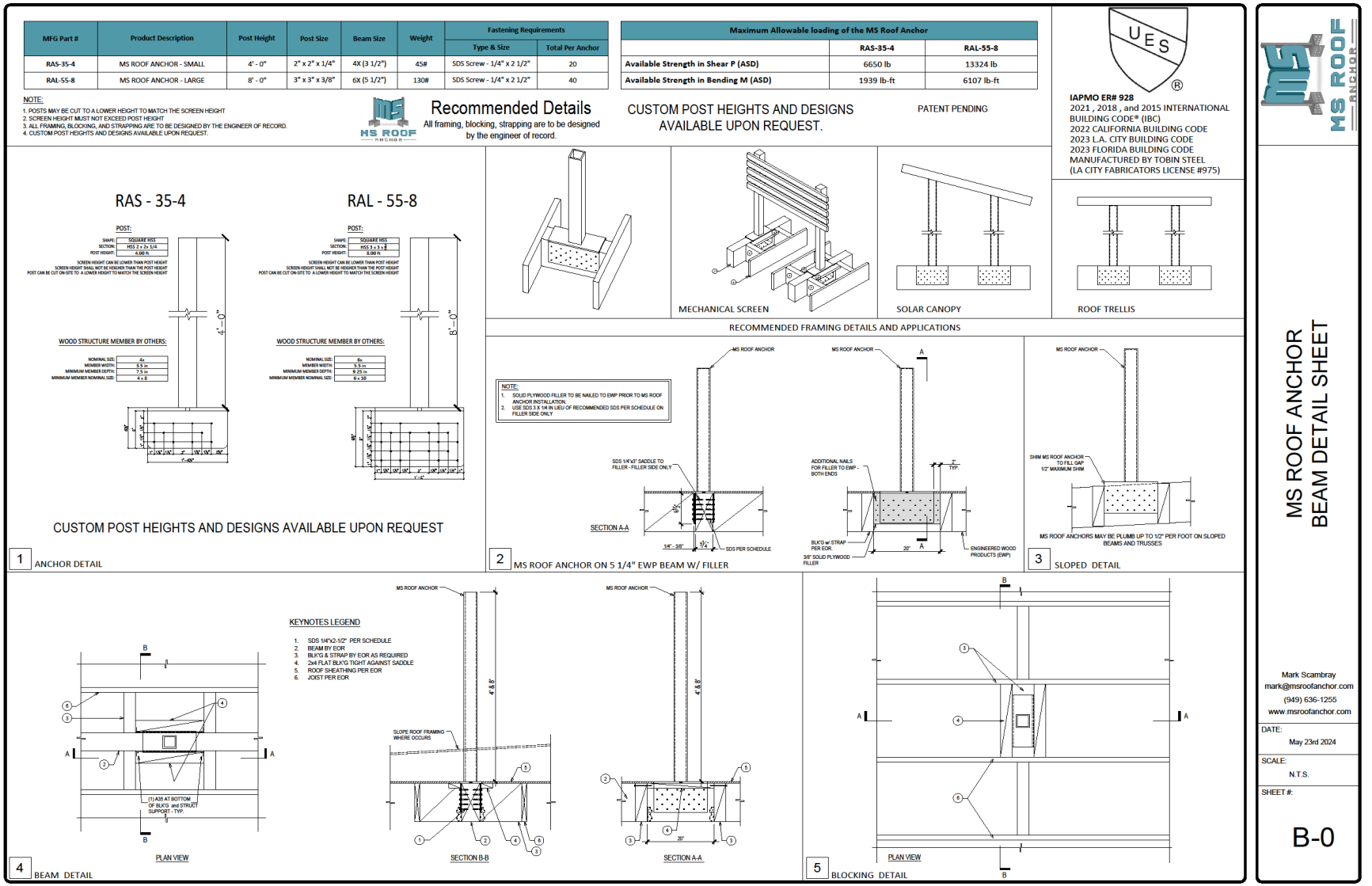
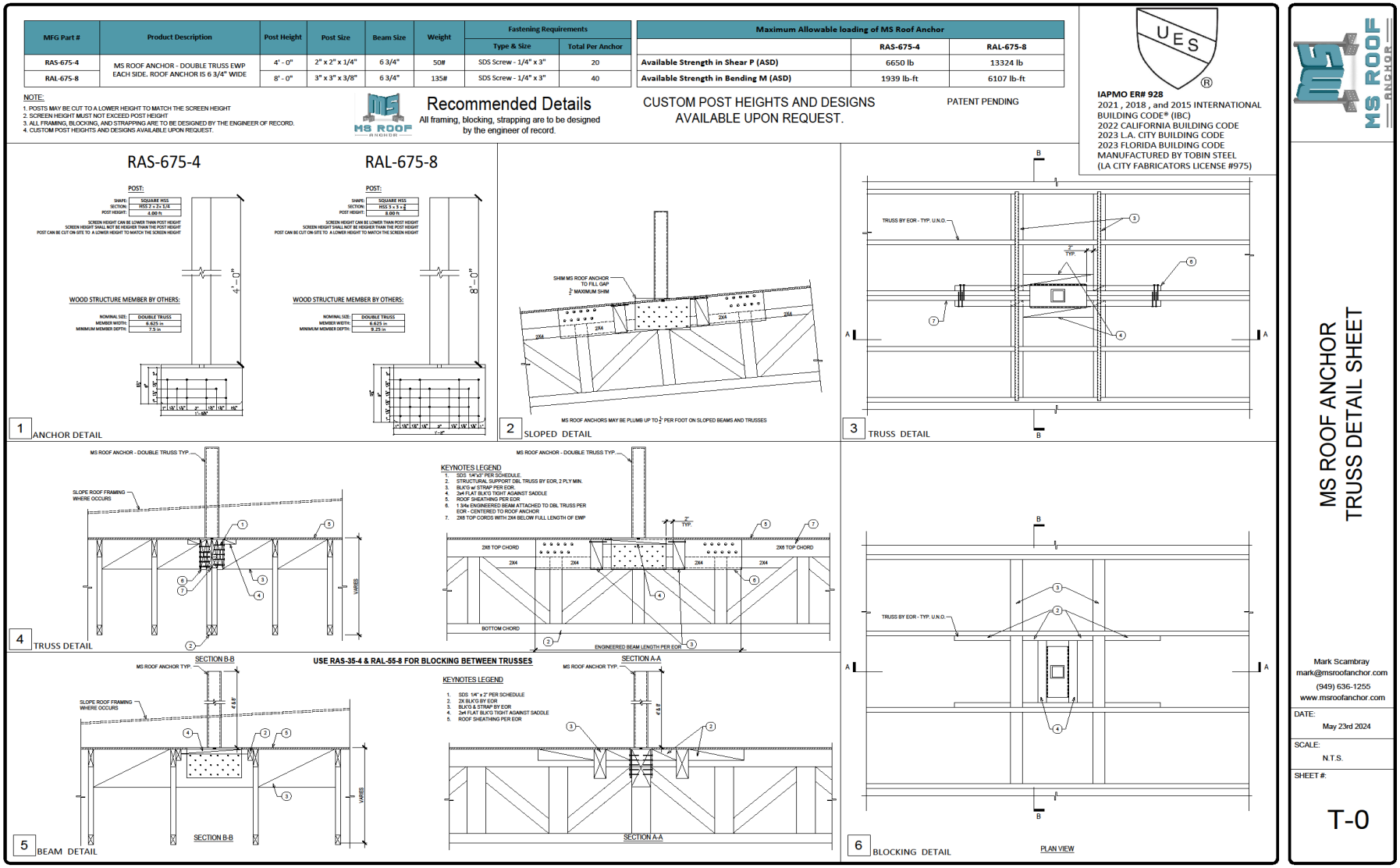


Figure 2 – MS Anchor Truss Detail Sheet



CALIFORNIA SUPPLEMENT

MS ROOF ANCHOR, LLC
6 Via Monarca Street
Dana Point, California 92629
949-636-1255
mark@msroofanchor.com
www.msroofanchor.com

MS ROOF ANCHOR

CSI Sections:

05 50 00 Metal Fabrications
06 05 23 Wood, Plastic, and Composite Fastenings

1.0 RECOGNITION

The MS Roof Anchor as evaluated and represented in IAPMO UES Evaluation Report IAPMO UES ER-928, and with changes as noted in this supplement, is a satisfactory alternative for use in buildings built under the following codes (and regulations):

- 2022 California Building Code (CBC)

2.0 LIMITATIONS

The MS Roof Anchor as described in IAPMO UES ER-928 complies with the 2022 CBC, subject to the following limitations:

2.1 The design, installation, conditions of use, and identification of the MS Roof Anchor shall be in accordance with the 2021 International Building Code, as applicable, as noted in IAPMO UES ER-928.

2.2 Construction documents, including calculations showing compliance with CBC Sections 107 and 1603 (Section 1603A for DSA and HCAi/OSHPD), and this report shall be submitted to the building official. The construction documents shall be prepared by a California registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.

2.3 When used on buildings located in a Fire Hazard Severity Zone or Wildland Interface Fire Area, as described in CBC Chapter 7A, the MS Roof Anchor is a noncombustible material.

2.4 This supplement expires concurrently with IAPMO UES ER-928.

CITY OF LOS ANGELES SUPPLEMENT

MS ROOF ANCHOR, LLC
6 Via Monarca Street
Dana Point, California 92629
949-636-1255
mark@msroofanchor.com
www.msroofanchor.com

MS ROOF ANCHOR

CSI Sections:
05 50 00 Metal Fabrications
06 05 23 Wood, Plastic, and Composite Fastenings

1.0 RECOGNITION

The MS Roof Anchor as evaluated and represented in IAPMO UES Evaluation Report ER-928, and with changes as noted in this supplement, is a satisfactory alternative for use in buildings built under the following codes (and regulations):

- 2023 City of Los Angeles Building Code (LABC)

2.0 LIMITATIONS

The MS Roof Anchor, as described in IAPMO UES ER-928, complies with the 2023 LABC, subject to the following limitations:

2.1 The design, installation, conditions of use, and identification of the MS Roof Anchor shall be in accordance with the 2022 California Building Code, as applicable, as noted in the California Supplement to IAPMO UES ER- 928.

2.2 Prior to installation, calculations and details demonstrating compliance with this approval report and the 2022 CBC, as applicable, shall be submitted to the structural plan check section for review and approval. The calculations and details shall be prepared, stamped, and signed by a California registered design professional.

2.3 The design, installation, and inspection of the MS Roof Anchor shall be in accordance with LABC Chapters 16 and 17, as applicable, due to local amendments to these chapters.

2.4 This supplement expires concurrently with IAPMO UES ER-928.

FLORIDA SUPPLEMENT

MS ROOF ANCHOR, LLC
6 Via Monarca Street
Dana Point, California 92629
949-636-1255
mark@msroofanchor.com
www.msroofanchor.com

MS ROOF ANCHOR

CSI Sections:
05 50 00 Metal Fabrications
06 05 23 Wood, Plastic, and Composite Fastenings

1.0 RECOGNITION

The MS Roof Anchor as evaluated and represented in IAPMO UES Evaluation Report IAPMO UES ER-928, and with changes as noted in this supplement, is a satisfactory alternative for use in buildings built under the following codes (and regulations):

- 2023 Florida Building Code, Building, 8th Edition (FBC, Building)

2.0 LIMITATIONS

The MS Roof Anchor, as described in IAPMO UES ER-928, complies with the 2023 FBC, Building, subject to the following limitations:

2.1 The design and installation of the MS Roof Anchor shall be by the 2021 International Building Code as noted in IAPMO UES ER-928.

2.2 Construction documents, including calculations showing compliance with FBC, Building, Sections 107 and 1603, and this report, shall be submitted to the building official. The construction documents shall be prepared by a registered design professional where required by Chapter 471, Florida Statutes, or Chapter 481, Florida Statutes.

2.3 Load combinations shall be in accordance with Section 1605.2 of the FBC, Building.

2.4 Design wind loads shall be in accordance with Section 1609.1.1 of the FBC, Building, and Sections 1620 where used in High-velocity Hurricane Zones (HVHZ).

2.5 Design wind loads for Rooftop Structures shall be in accordance with Section 1609.1.1 of the FBC, Building, and Section 1620.6, including ASCE/SEI 7 Chapter 29, where used in High-velocity Hurricane Zones (HVHZ).

2.6 Design wind loads for Screen Enclosures shall be in accordance with Section 1609.1.1 of the FBC, Building, and Section 1622, where used in High-velocity Hurricane Zones (HVHZ).

2.7 For products falling under Section (5)(d) of Florida Rule 61G20-3.008, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission (or the building official when the report holder does not possess an approval by the Commission) is required to provide oversight and determine that the products are being manufactured as described in this evaluation report to establish continual product performance.

2.8 This supplement expires concurrently with IAPMO UES ER-928.

For additional information about this evaluation report please visit www.uniform-es.org or email us at info@uniform-es.org