CODE EVALUATION REPORT

CERUS-1043

PUBLISHED: August 2025
EXPIRATION: March 2027

PRODUCT(s): **QUADRA STEEL ROOF TILES**

REPORT HOLDER: Bravo International CZ s.r.o.

CONTACT DETAILS:
Pod Renou 1609/1
Ivancice
66491 Czech Republic
www.bravointernational.group

CSI DIVISIONS: 07 00 00 – Thermal and Moisture Protection

CSI SECTION:
07 31 16 – Metal Shingles
07 41 13 – Metal Roof Panels

APPLICABLE CODES:
2024, 2021, 2018 International Building Code (IBC)
2024, 2021, 2018 International Residential Code (IRC)
2023 Florida Building Code (FBC)
2022 California Building Code (CBC)

EVALUATED:
Weather Resistance.
Wind Resistance.
Roof Fire-Classification.
Hail-Impact Resistance.
Corrosion Resistance.

IAS ACCREDITED Product Certification Agency PCA-118

1.0 APPROVED FOR FOLLOWING:

APPROVED TYPES OF CONSTRUCTION:	Type I-V/ AB
APPROVED USE:	Roof coverings for use in Class A, B & C fire-classified assemblies.
APPROVED INSTALLATIONS:	Roofs including fire-classified roof assemblies.

2.0 DESCRIPTION:

2.1 General:

Bravo Quadra steel shingles are diamond shape roof coverings formed from 25-gauge (0.02-inch, 0.5 mm) thickness, G90 galvanized steel complying with ASTM A653. Bravo Quadra steel shingles are coated with a 40 µm polyester paint layer available in various color options. Bravo Quadra steel shingles are intended for use on slopes ≥ 5:12 (42%) as specified in Bravo International's published installation instructions in accordance with 2024 /2021/2018 IBC and 2024/2021/2018 IRC. Bravo Quadra steel shingles are available with various accessories for installation onto a code complying roof.

When installed in accordance with Section 4.4 and Table 3 of this report, Bravo Quadra steel shingles provide Class A, B or C roof-fire assemblies determined in accordance with Section 1505 of the 2024/2021/2018 IBC and Section R902.1 of the 2024/2021/2018 IRC.

Bravo Quadra steel shingles comply for use as roof coverings per the 2023 Florida Building Code (FBC), including for use in areas defined as high velocity hurricane zones (HVHZ). See Section 10 of this report for further details.

Bravo Quadra steel shingles comply for use as roof coverings per the 2022 California Building Code (CBC) including use in Class A roof-fire classified assemblies as required in areas defined as a Wildland-Urban Interface (WUI) in Chapter 7A of the CBC when installed over a non-combustible substrate in accordance with Section 4.4 and Table 3 of this report. See Section 10 of this report for further details.

2.2 Products:

2.2.1 Bravo Quadra Steel Shingles:

See Table 1 below for the properties of the recognized models of Bravo Quadra steel shingles.

Table 1 – Bravo Metal Roofing Tile Properties

Product	Length		Width		Installed Weight		Installed Exposure	
	Inches	mm	Inches	mm	lbs/ft^2	kg/m^2	Inches	mm
Quadra Steel Slate	16.3	413	17.25	438	0.81	4	15.5	394

3.0 DESIGN:

Bravo Quadra steel shingles outlined in this report comply with performance requirements outlined in Section 1504 of the 2024/2021/2018 IBC, 2023 FBC, and 2022 CBC, including compliance for use as metal roof shingles in accordance with Section 1507.5 of the 2024/2021/2018 IBC, 2023 FBC, 2022 CBC and Section R905.4 of the 2024/2021/2018 IRC. Bravo Quadra steel shingles are to be installed on roofs with minimum slopes of 5:12 (42%) as specified by the manufacturer's published installation instructions.

Where installed in accordance with Section 8.1 of this report Bravo Quadra steel shingles are limited to applications to maximum allowable uplift pressures listed in Table 2. Use in applications greater than those stated require design by a registered design professional and approval by the authority having jurisdiction.

4.0 INSTALLATIONS:

4.1 General:

Installation of Bravo Quadra steel shingles must comply with the manufacturer's published installation instructions, this report, and the applicable code(s). Where differences are found, this report and the applicable building code shall be followed.

Bravo Quadra steel shingles are intended for installation onto minimum 5:12 (42%) roof slopes. Bravo Quadra steel shingles are intended for use as the finished roof covering on new and over existing construction where existing roof coverings have been removed in accordance with Section 4.2 and 4.3 of this report as applicable. When used in applications requiring roof-fire classified assemblies, installation shall conform to Section 4.4 and Table 3 of this report.

Bravo Quadra steel shingles require direct-to-deck installation over plywood sheathing of minimum 15/32-inch (12 mm) thickness complying with the applicable code. Each tile is attached using two Quadra clamps which are fastened to the sheathing using one screw each installed at a preformed hole on the clamp. Attachment of the sheathing to underlying framing elements is outside the scope of this report and shall be sufficient to resist service loads.

Flashing, counterflashing, and valley flashing shall be sheet metal complying with the applicable code. Sheet metal must be G90 galvanized of minimum thickness in accordance with applicable code. Valley flashing shall be a minimum 15 inches (381 mm) wide sheet metal complying with applicable code. Flashing, including fasteners, shall not be in contact with dissimilar metals to avoid corrosion. Flashing shall prevent moisture from entering the wall and roof in accordance with Section 1503.2 of the 2024/2021/2018 IBC and Section R903.2 of the 2024/2021/2018 IRC.

While not required, drip edge flashings and rake edge flashings are recommended, installed with good roofing practice.

4.1.1 Special Inspection:

2024/2021 IBC Section 1705.12: Special inspection including periodic special inspection for wind resistance are required for buildings constructed in the following areas:

1. Wind Exposure Category B, where V_{Ult} is ≥ 150 mph (241 km/hr).
2. Wind Exposure Category C or D, where V_{Ult} is ≥ 140 mph (225 km/hr).

Special inspection is to confirm installation is in conformance with Section 8.1 of this report. Installation in areas of maximum V_{Ult} of 130 mph (209 km/hr), maximum mean roof height of 40 ft (12.2 m) and Exposure Category B do not require special inspection.

4.1.2 Underlayment:

Underlayment must comply with and be installed in accordance with 2024/2021/2018 IBC Sections 1507.1.1 and 2024/2021/2018 IRC Sections R905.1.1 as applicable. For fire-classified roof assemblies, underlayment shall be installed in accordance with Table 3 and Section 4.4 of this report. Underlayment must comply with and be installed in accordance with the applicable code and the manufacturer's published installation instructions.

In areas where there is potential for or has been a history of ice forming along eaves causing the backup of water an ice barrier is required. The ice barrier may consist of:

a) Two layers of ASTM D226 Type I, ASTM D4869 Type I or ASTM D6757 underlayment cemented together or
b) A self-adhering polymer modified bitumen sheet complying to ASTM D1970.

Alternate ice barriers are outside the scope of this report but may be used where approved by the authority having jurisdiction. The ice barrier shall be used as an alternative to the normal underlayment, extending from the lowest edges of all roof surfaces to a point at least 24 inches (610 mm) inside the exterior wall line of the structure. Following, the standard underlayment shall be lapped over the ice barrier and shall overlap a minimum of 4 inches (102 mm). Attachment and overlapping of the ice barrier to underlayment are outside the scope of this report and is to be in accordance with the applicable code and the ice barrier manufacturer's published installation instructions.

4.2 New Construction:

Bravo Quadra steel shingles are to be installed directly on solid or closely fitted minimum 15/32-inch (12 mm) thickness plywood complying with the applicable code. A half-size starter tile is secured along the eave with clamps attached and is fastened in place with placement of the shingle with less than 1'' (25 mm) projecting beyond the roof eave. Full-length tiles are then attached atop the approved underlayment, beginning at the eave line, locking into the starter tiles. Tiles can be installed from left to right or right to left. Each tile is fastened to the substrate using clamps and fasteners as specified in Table 2 of this document. Each additional row of tiles is installed by locking the bottom edges into the top folded groove of the tile below per manufacturer instructions. When used in applications requiring a fire-classified roof assembly, installation shall follow Section 4.4 and Table 3 of this report.

4.3 Reroofing Applications:

Bravo Quadra steel shingles are not intended for installation over existing roof systems. Existing roof coverings and underlayment are to be removed, and roof sheathing and penetrations are to be inspected to ensure the roof structure is free of rot and damage prior to installation of the Bravo products. All past existing roof coverings shall be completely removed, following all installation conditions noted in Section 4.1 and 4.2. When used in applications requiring a fire-classified roof assembly, installation shall follow Section 4.4 and Table 3 of this report.

4.4 Roof Fire Classified Assemblies:

Bravo Quadra steel shingles comply for use as Class A, Class B, and Class C roof-assemblies per 2024/2021/2018 IBC Section 1505.1 and 2024/2021/2018 IRC Section R902.1. Installation and assembly details, including maximum roof slope, are to be in accordance with Table 3 in Section 8.2 of this report.

4.5 Hail Impact Resistant Assemblies:

Bravo Quadra steel shingles are Class IV impact resistance rated evaluated following UL 2218. Bravo Quadra steel shingles are classified as Very Severe Hail (VSH) resistant evaluated in accordance with FM 4475 when installed in accordance with Table 4 of this report.

5.0 LIMITATIONS:

- Installation of Bravo Quadra steel shingles are to comply with the applicable codes, this report and the manufacturer's installation instructions. Where differences are found, the applicable code and this report shall be followed.
- Bravo Quadra steel shingles are intended for use on roof slopes ≥ 5:12 (42%).
- Maximum allowable wind uplift pressures are specified in Table 2 of this report. Use in applications requiring greater wind uplift resistance are outside the scope of this report and require engineering design.
- Attachment of sheathing to underlying framing members is outside the scope of this report and shall be in compliance with the applicable code and be sufficient to resist uplift forces and service loads required.
- Special inspection for wind resistance may be required as per Section 4.1.1 of this report.
- Bravo Quadra steel shingles used in Class A, Class B and Class C roof-fire classified assemblies are to be installed in accordance with Sections 4.4 and 8.2 Table 3 of this report.
- Bravo Quadra steel shingles used in hail-prone areas are to be installed in accordance with Sections 4.5 and 8.3, Table 4 of this report.
- Bravo Quadra steel shingles are manufactured in Ivancice, Czech Republic with inspections by QAI Laboratories.

6.0 SUPPORTING INFORMATION:

The following data has been evaluated for Bravo Quadra steel shingles products:

- Data for use in roof fire classified assemblies determined in accordance with ASTM E108.
- Data for wind uplift evaluated in accordance with UL 580 and TAS 125.
- Data for outlining class IV impact resistance per UL 2218.
- Data for impact testing for Very Severe Hail classification per FM 4475.
- Data for wind driven rain in accordance with TAS 100.
- Data for salt spray resistance in accordance with ASTM B117.

7.0 MARKING:

Bravo Quadra steel shingles finished products are labeled with the product and model name, manufacturer's name (Bravo International CZ) location of manufacture, and the QAI CERus-1043. Examples of finished product labels can be seen in Figure 1 below.

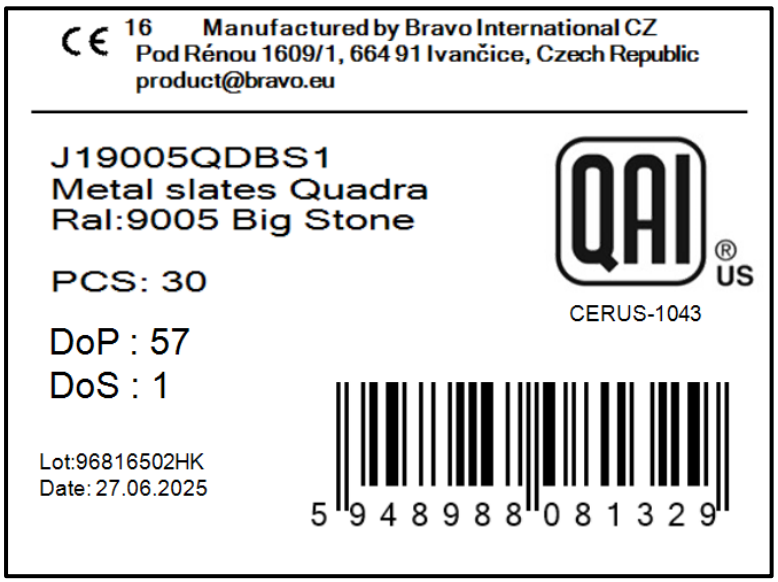

Figure 1 – Representative Example of Bravo Quadra Steel Shingles Finished Product Label

8.0 RESULTS / RATINGS:

8.1 Wind Uplift Resistance

Table 2 – Wind Uplift Classification Assembly Details

System No.	Substrate[1]	Roofing Tile	Attachment	Fastening	Allowable Wind Uplift Pressure[2]	
					psf	kPa
1	Minimum 15/32-inch (12 mm) plywood	Quadra Steel Slate	Two (2) Quadra Clamp per Shingle	One (1) #6 by 2-inch (51mm) length panhead coarse thread wood screw per Quadra Clamp	101	4.8
2	Minimum 3/4-inch (19 mm) plywood	Quadra Steel Slate	Two (2) Quadra Clamp per Shingle	One (1) #6 by 2-inch (51mm) length panhead coarse thread wood screw per Quadra Clamp	129	6.2

1. Attachment of sheathing to underlying framing members and attachment of battens is outside the scope of this report and shall be sufficient to resist uplift forces required.
2. Maximum uplift pressure was determined in accordance with method UL 580 / TAS 125 with a factor of safety of 2.0 applied to ultimate pressure achieved of the average of three identical assemblies.
3. See Section 4.1.1 where Special Inspection of the above installation is required.
4. One fastener is used per Quadra Clamp as per Bravo's installation guidelines.

8.2 Roof Fire Classified Assemblies:

Table 3 – Roof Fire Classified Assemblies

System	Substrate	Approved Underlayment[2]	Approved Roof Coverings	Installation Guidelines	Maximum Slope	Class
New construction or reroof when existing roof is removed[1]	Minimum 15/32-inch (12 mm) plywood	One layer of GAF VersaShield™ applied over one layer of ASTM D226 Type II asphalt felt.	Quadra Steel Slate	See Sections 4.1, 4.2, 4.3, 4.4	Unlimited	B
New construction or reroof when existing roof is removed[1]	Minimum 15/32-inch (12 mm) plywood	Two layers of GAF VersaShield™.	Quadra Steel Slate	See Sections 4.1, 4.2, 4.3, 4.4	Unlimited	B
New construction or reroof when existing roof is removed[1]	Minimum 15/32-inch (12 mm) plywood	One layer of ASTM D226 Type II asphalt felt.	Quadra Steel Slate	See Sections 4.1, 4.2, 4.3, 4.4	Unlimited	C
New construction or reroof when existing roof is removed[1]	Non-Combustible[3] substrate covering underlying wood structural sheathing.	Unrestricted	Quadra Steel Slate	See Sections 4.1, 4.2, 4.3, 4.4	Unlimited	A

1. Installation of the Bravo Quadra steel shingles require complete removal of existing roof coverings and underlayment and inspection prior to installation in accordance with Section 4.3 of this report.
2. Underlayment installation is to have joints offset where multiple layers exist, with underlayment installation to comply with the applicable code and the manufacturer's published installation instructions.
3. Non-combustible substrates complying with ASTM E136.

8.3 Impact Rated Assemblies:

Table 4– Impact Rated Assemblies

Substrate	Approved Underlayment	Approved Roof Coverings	Installation Guidelines	Hail-Impact Classification[1]
Minimum 15/32-inch (12 mm) plywood	Unrestricted	Quadra Steel Slate	See Sections 4.1, 4.2, 4.3, 4.4	Class 4 and VSH

1. Hail-impact classification determined in accordance with UL 2218 and FM 4475.

9.0 PRODUCT DETAILS:

9.1 Bravo Quadra Steel Shingles Product Drawings

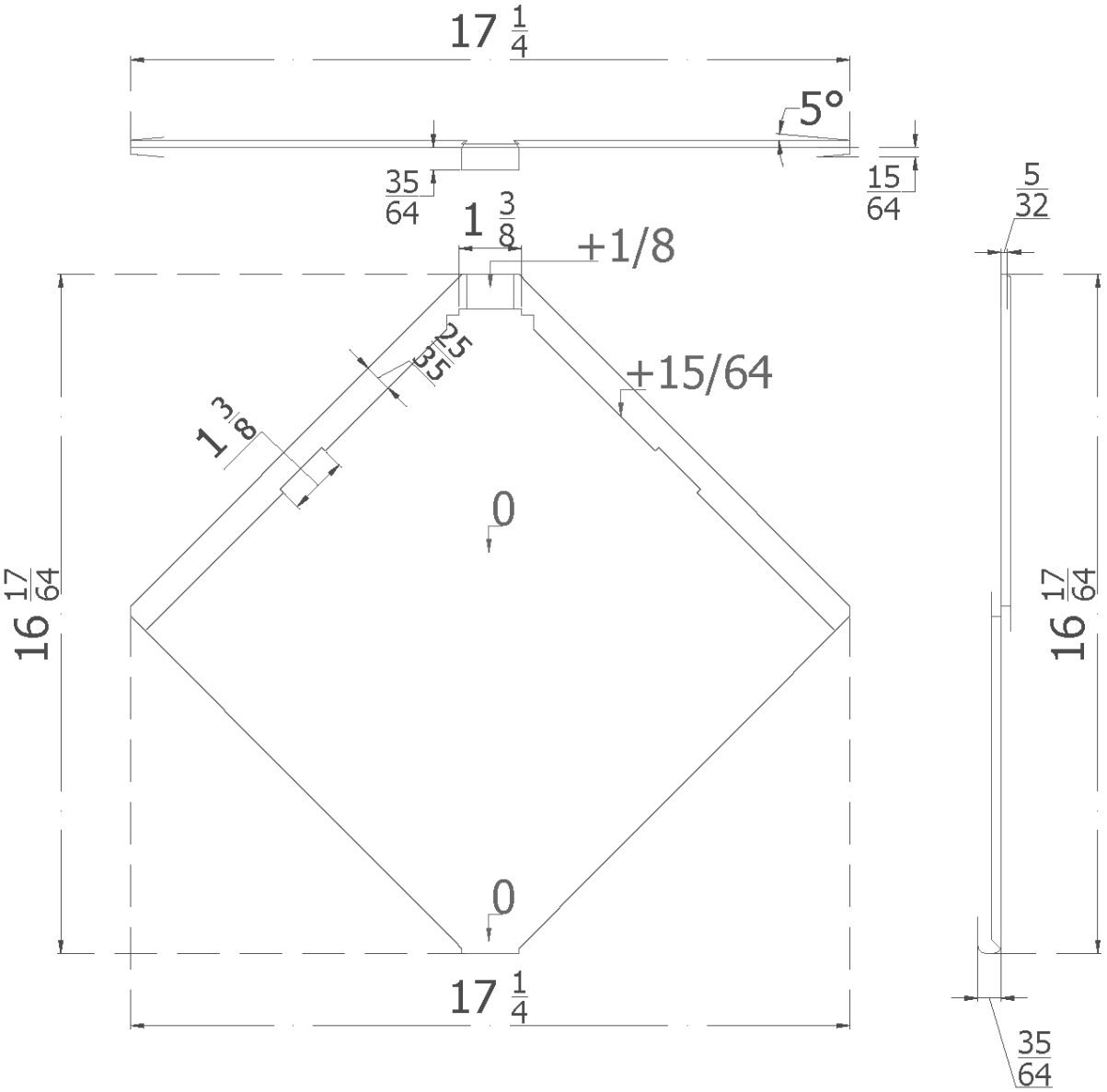

Figure 2 – Bravo Quadra Steel Slate Details

10.0 SUPPLEMENTAL CODES

10.1 2023 Florida Building Code:

Bravo Quadra steel shingles as detailed in Sections 2.0 through 9.0 of QAI CER$_{US}$-1043 comply with the 2023 Florida Building Code (FBC) requirements for a roof covering including Section 1507.4 when installed in accordance with the applicable building codes and this report including for use high velocity hurricane zones (HVHZ) for applications as outlined in this report. Bravo Quadra steel shingles are to be installed on roofs with minimum slopes of 5:12 (42%) when installed in areas defined as HVHZ.

Bravo Quadra steel shingles Class A, Class B and Class C fire classified assemblies comply with Section 1516 of the 2023 FBC. Bravo Metal Roofing Tiles comply with the steel thickness and corrosion resistance requirement in Section 1518.9 of the 2023 FBC. Bravo Quadra steel shingles have met the Wind Driven Rain requirements outlined in method TAS 100 as referenced in the 2023 FBC section 1523.6.5.

10.2 2022 California Building Code:

Bravo Quadra steel shingles as detailed in Sections 2.0 through 9.0 of QAI CER$_{US}$-1043 comply with the 2022 California Building Code (CBC) when installed in accordance with the applicable building codes and this report. Bravo Quadra steel shingles installed over a non-combustible substrate in accordance with Section 4.4 and Table 3 of this report, identified as Class A roof-fire classified assemblies comply for use in Fire Hazard Severity Zones or Wildland-Urban Interface (WUI) Fire Areas as outlined in Section 705A of the 2022 CBC.

11.0 ELIGIBILITY OF REPORT

QAI's Code Evaluation Report complies with the 2024 IBC Section 104.2 and / 2021 / 2018 IBC Section 104.11 *Alternative materials, design and methods of construction and equipment,* 2024 IBC subsection 104.2.3.6.1 *Evaluation reports* and 2021 / 2018 / 2015 subsection104.11.1 *Research Reports*. Supporting data has been evaluated by QAI for compliance of the noted materials and assemblies to the applicable code by QAI, and *approved* source as detailed below.

The attached report has been reviewed by a QAI Registered Professional Engineer approved by the specific state Board of Professional Engineers noted on the specific P.E. seal(s).

Per section 1703 of the IBC, QAI is an independent third-party testing, inspection and certification agency accredited by the International Accreditation Service, Inc. (IAS) for this specific scope (see IAS PCA-118). QAI can confirm that based on its IAS accreditation it meets IBC Section 1703.1 on Independence, Section 1703.1.2 on Equipment and Section 1703.1 on Personnel.

This Evaluation report has been designed to meet the performance requirements of IBC Section 1703.4 and contains the required information to show the product, material or assembly meets the applicable code requirements.

The product is labeled per section IBC 1703 and subject to follow-up inspection per IBC 1703.6 using QAI IAS accredited ISO/IEC 17020 inspection program (see IAS AA-723).

For more information regarding QAI Laboratories, please visit www.qai.org.

The above is an example of the QAI registered Listing mark. The Listing mark may only be used by the Report Holder per the QAI service agreement on products defined in this report. The 'us' indicator in the 4 o'clock position indicates the product complies with the properties evaluated with limitations outlined in this report for use in the US market. A 'c' indicator in the 8 o'clock position indicates the product has been evaluated for use in the Canadian market.

IAS ACCREDITED Product Certification Agency PCA-118

12.0 REFERENCED STANDARDS

ASTM E108 *Standard Test Methods for Fire Tests of Roof Coverings.*
UL 580 *Test for Uplift Resistance of Roof Assemblies*
TAS 125 *Standard Requirements for Metal Roofing Systems*
UL 2218 *Standard for Safety Impact Resistance of Prepared Roof Covering Materials*
FM 4475 *Steep Slope Roof Covers*
TAS 100 *Test Method for Wind and Wind Driven Rain Resistance of Discontinuous Roof Systems*
ASTM A653 *Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process*
ASTM E136 *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C*
ASTM B117 *Standard Practice for Operating Salt Spray (Fog) Apparatus*