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The Subcommittee on Evaluation has reviewed the data submitted for compliance with the *Standard Building Code*® and submits to the Building Official or other authority having jurisdiction the following report. The Subcommittee on Evaluation, ICC-ES and its staff are not responsible for any errors or omissions to any documents, calculations, drawings, specifications, tests or summaries prepared and submitted by the design professional or preparer of record that are listed in the Substantiating Data Section of this report. Portions of this report were previously included in Evaluation Report #9649.

REPORT NO.: 9649A

EXPIRES: See the current EVALUATION REPORT LISTING

CATEGORY: ROOF COVERING AND ROOF DECK
CONSTRUCTION

SUBMITTED BY:

TALLANT INDUSTRIES, INC.
4900 ONDURA DRIVE
FREDERICKSBURG, VIRGINIA 22407

1. PRODUCT TRADE NAME

Licensee

Ondura Corporation
4900 Ondura Drive
Fredericksburg, Virginia 22407

Trademark

- Ondura (corrugated sheets and tiles)

2. SCOPE OF EVALUATION

- Weather Resistance
- Wind Resistance
- Fire Classification

3. USES

The Ondura corrugated asphalt roofing sheets and the Ondura corrugated asphalt tile are used as Class C roof coverings.

4. DESCRIPTION

4.1 Ondura Corrugated Asphalt Roofing Sheets

The Ondura corrugated asphalt roofing sheets are corrugated roofing sheet material made of pulpboard sealed with a bitumen coating. The top surface is available in various colors. The sheets are 48 inches (1.22 m) wide by 78-7/8 inches (2 m) long and have 1-3/8 inch (35 mm) deep corrugations along their length

at 4 inches (100 mm) apart. The sheets weigh approximately 0.68 lb/ft² (3.32 kg/m²) and are approximately 0.11 inches (2.8 mm) in thickness. Accessories include ridge caps made of the same material as the sheets, closure strips, and Ondura washered nails. Ondura washered nails are 3 inch (76 mm) long, 0.135 inch (3.4 mm) diameter ring shank galvanized steel nails having a 7/16 inch (11 mm) diameter head and a 1/8 inch (3.2 mm) thick by 5/8 inch (16 mm) O.D. EPDM rubber washer.

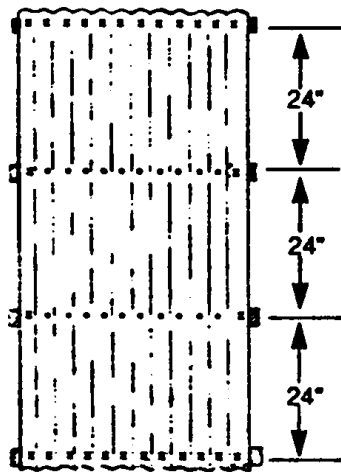
When tested in accordance with ASTM E 108, the Ondura corrugated asphalt roofing sheets demonstrated a roof covering classification of Class C. When installed in a manner consistent with that indicated in Section 5.2 below and tested for wind uplift resistance in accordance with FM 4470, the Ondura corrugated asphalt roofing sheets demonstrated an ultimate uplift resistance of 60 psf (2870 N/m²). Thus, installation of the system is permitted in areas where the design wind loads on the roof do not exceed 30 psf (1437 N/m²). When tested for accelerated weathering in accordance with ASTM G 53 for 2000 hours, the paint coating on the roofing material remained intact but changed from a gloss to a dull finish. Ultimate tensile strength and % elongation of weathered specimens showed little change from that exhibited by specimens tested prior to weathering.

4.2 Ondura Corrugated Asphalt Tiles

The Ondura corrugated asphalt tiles are corrugated asphalt roofing tiles of the same composition as the Ondura corrugated asphalt roofing sheets described in Section 4.1 of this report. The tiles are 48 inches (1.22 m) wide by 19-3/4 inches (502 mm) long and have the same corrugation pattern, weight, and thickness as the sheet described in Section 4.1. Accessories are the same as those noted for the sheet.

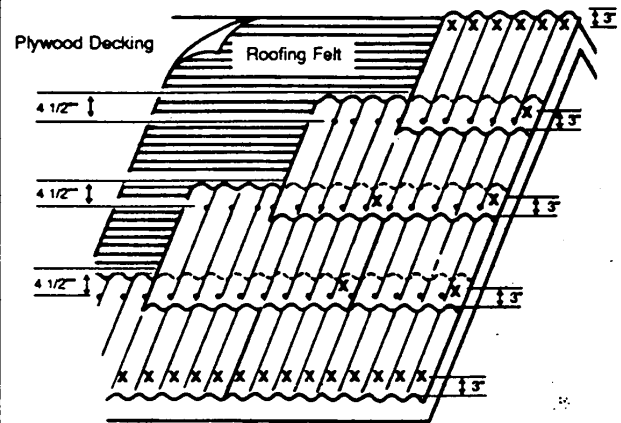
Fire classifications and weathering testing noted above for the Ondura corrugated asphalt roofing sheets are applicable to the Ondura corrugated asphalt tiles as well. When installed in a manner consistent with that indicated in Section 5.3 below and tested for wind uplift resistance in accordance with FM 4470, the Ondura corrugated asphalt tiles demonstrated an ultimate uplift resistance of 94 psf (4500 N/m²) when installed using the nailing pattern shown in Figure 2 below. Thus, installation of the system is permitted in areas where the design wind loads on the roof do not exceed 47 psf (2250 N/m²). When installed using the nailing pattern shown in Figure 3 below, the Ondura corrugated asphalt tiles demonstrated an ultimate uplift resistance of 109 psf (5220 N/m²). Thus, this system installed with the enhanced nailing is permitted in areas where the design wind loads on the roof do not exceed 54 psf (2610 N/m²).

Figure 1:



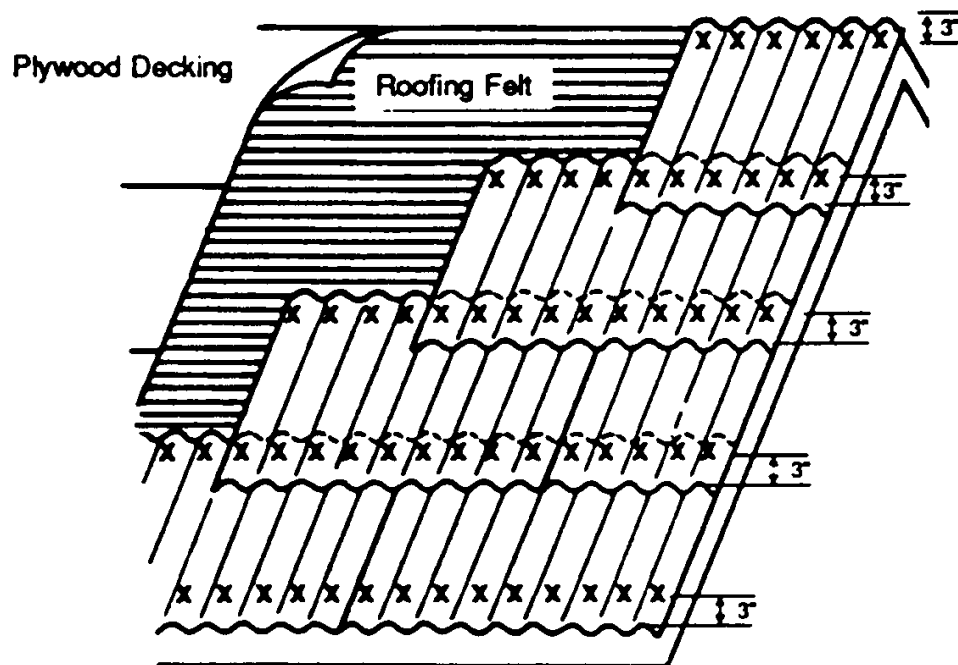
Note: Edges with X's are not nailed down until lapped by adjoining sheets using 3" Ondura nails.

Figure 2:



* = Roofing nail in valley under lap 4 1/2" from edge of tile
 X = 3" Ondura nail in corrugation crown at endlaps and in every corrugation along starter row and end row.

Figure 3:



X = 3" Ondura nail in every corrugation crown at endlaps and in every corrugation along starter row and end row.

5. INSTALLATION

5.1 General

The manufacturer's published installation instructions, Section 1509 of the *Standard Building Code*, and this report shall be strictly adhered to and a copy of these instructions shall be available at all times on the job site during installation. The instructions within this report and Section 1509 of the *Standard Building Code* will govern if there are any conflicts between the manufacturer's instructions and this report.

5.2 Ondura Corrugated Asphalt Roofing Sheets

The Ondura corrugated asphalt roofing sheets shall be installed over solid decks of exterior grade plywood having a minimum thickness of ½ inches (12.7 mm) and a minimum roof slope of 3:12.

Underlayment shall consist of one layer of No. 30 felt laid parallel to the eaves with a 2 inch (51 mm) top lap and a 4 inch (102 mm) end lap nailed sufficiently to hold the underlayment in place.

Sheets shall be nailed to the roof using Ondura's ring shanked, washered nails of sufficient length to penetrate the deck a minimum of ¾ inch (19 mm). Sheets shall be installed with every crown nailed at 24 inches (610 mm) on center with single corrugation overlap at the sides and 7 inch (180 mm) overlaps at the ends (See Figure 1 for an illustration of this nailing pattern). This system is permitted in areas where the design wind loads on the roof do not exceed 30 psf (1437 N/m²). Stagger the sidelaps between rows of sheets.

Ridge caps, hip covers, valley flashing, sidewall flashing, flashing at protrusions, closure strips, and other such items shall be installed as required by the manufacturer's instructions to give weather integrity to the roofing system.

5.3 Ondura Corrugated Asphalt Tiles

The Ondura Corrugated Asphalt Tile Roofing System shall be installed over solid decks of exterior grade plywood having a minimum thickness of ½ inches (12.7 mm) and a minimum roof slope of 3:12.

Underlayment shall consist of one layer of No. 30 felt laid parallel to the eaves with a 2 inch (51 mm) top lap and a 4 inch (102 mm) end lap nailed sufficiently to hold the underlayment in place.

Nails placed at tile crowns shall be Ondura's ring shanked, washered nails of sufficient length to penetrate the deck a minimum of ¾ inch (19 mm). Nails placed in the tile valleys at the underlaps, when required, shall be galvanized roofing nails having sufficient length to penetrate the deck a minimum of ¾ inch (19 mm). The roofing nails shall also have a minimum 0.125 inch (3.18 mm) diameter shank and a minimum 0.410 inch (10.4 mm) diameter head. Tiles shall be installed with single corrugation overlap at the sides and 5-¾ inch (150 mm) overlaps at the ends. In applications where the design wind loads on the roof do not exceed 47 psf (2250 N/m²), the nailing pattern shown in Figure 2 is required. In applications where the design wind loads on the roof do not exceed 54 psf (2590 N/m²), the nailing pattern shown in Figure 3 is required. Sidelaps are staggered between rows of tiles.

Ridge caps, hip covers, valley flashing, sidewall flashing, flashing at protrusions, closure strips, and other such items shall be installed as required by the manufacturer's instructions to give weather integrity to the roofing system.

6. SUBSTANTIATING DATA

- 6.1 Manufacturer's descriptive literature, installation instructions, and quality control manual.
- 6.2 Report of wind uplift testing (FM 4470), wind driven rain testing, and weathering testing (ASTM G 53), prepared by Warnock Hersey Professional Services Ltd., Project 50484-C7-706400, Report No. 1/90 Rev., dated July 31, 1990, signed by Farid Mawani, P. Eng.
- 6.3 Report of impact resistance testing per ASTM D-3746, prepared by Warnock Hersey Professional Services Ltd., Project 50484-C7-753300, Report No. 1/91 Rev., dated February 12, 1991, signed by Paul Arnold.
- 6.4 Report of accelerated weathering (ASTM G 53) and dynamic impact testing, prepared by Warnock Hersey Professional Services Ltd., Project 50484-C7-753300, Report No. 2/91 Rev., dated September 30, 1991, signed by Paul Arnold.
- 6.5 Report of wind uplift testing (FM 4470), prepared by Inchcape Testing Services (Warnock Hersey), Project 481-1080, Report No. 1/95, dated July 19, 1995, signed by Doug Docherty.
- 6.6 Fire tests conducted in accordance with ASTM E 108 on the Ondura corrugated asphalt roofing sheets, SwRI Project No. 01-6743-016, dated June, 1995, signed by Charles C. Bailey and Alex B. Wenzel.
- 6.7 Letter prepared by Southwest Research Institute concerning fire classification, dated April 17, 1996, signed by Charles C. Bailey and Alex B. Wenzel.

7. CODE REFERENCES

Standard Building Code - 1994 Edition

Section 103.7	Alternate Material and Methods
Section 505	Buildings Located Within a Fire District
Section 1509	Roof Coverings
Section 1606	Wind Loads
Section F102.2.4	Other Specific Requirements

8. COMMITTEE FINDINGS

The Subcommittee on Evaluation in review of the data submitted finds that, in their opinion, the Ondura corrugated asphalt roofing sheets and the Ondura corrugated asphalt tiles as described in this report conform with or are suitable alternates to that specified in the *Standard Building Code* or Supplements thereto.

9. LIMITATIONS

- 9.1 This Evaluation Report and the installation instructions, when required by the building official, shall be submitted at the time of permit application.
- 9.2 The manufacturer's published installation instructions, Section 1509 of the *Standard Building Code*, and this report shall be strictly adhered to.
- 9.3 The Ondura corrugated asphalt roofing sheets and the Ondura corrugated asphalt tiles shall not be installed on roofs having slopes of less than 3:12.

- 9.4 The Ondura corrugated asphalt roofing sheets and the Ondura corrugated asphalt tiles shall not be installed on roofs of buildings located in a fire district.
- 9.5 The Ondura corrugated asphalt roofing sheets shall not be installed on roofs where the design wind uplift pressures exceed 30 psf (1437 N/m²).
- 9.6 The Ondura corrugated asphalt tile shall not be installed on roofs where the design wind uplift pressures exceed 47 psf (2250 N/m²) or 54 psf (2610 N/m²), depending on the nailing pattern as noted in Section 5.3 above.

10. IDENTIFICATION

All packaging of the Ondura corrugated asphalt roofing sheets and the Ondura corrugated asphalt tiles as described in this report shall bear the manufacturer's name and/or trademark, SBCCI Public Safety Testing and Evaluation Services, Inc.'s Seal, and the number of this report for field identification.

11. PERIOD OF ISSUANCE

SEE THE CURRENT EVALUATION REPORT LISTING FOR STATUS OF THIS EVALUATION REPORT.

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