pdgDOMUS MANUFACTURING, LLC
426 Whittier Street
Columbus, OH 43206

DIVISION: 07 THERMAL & MOISTURE PROTECTION

CATEGORY: **PATIO DECK PANEL**

ALTERNATIVE BUILDING PRODUCT TESTS FOR R-3, U or 1-3 FAMILY

INTRODUCTION
The deck materials are manufactured by pdgDOMUS. The materials were tested per OBC Section 118, and a lab listed in Appendix O. The lab selected – Progressive Engineering, Inc. The OBC references for the scope of testing are from OBC Sections 1504, ICC-ES Acceptance Criteria and evaluation Guidelines document AC07, OBC Chapter 17, Section 1714, which also references OBC Chapter 16, Section 1604.3 for deflection limitations, and ORC Chapter 9.

This report for low roofs, similar to ICC ES ER – 6114, outlining materials involved in the roofing systems, and the installation method and requirements, sealed by Antonio Colosimo, Architect, State of Ohio, is submitted.

1.0 SUBJECT
PdgDOMUS Patio Deck Panels.

2.0 DESCRIPTION

2.1 General:

The pdgDOMUS Deck Panels are factory-assembled foam core sandwich panels with _ -inch gypsum board on the interior face, and an in-house manufactured composite weathering surface. The panel frame is constructed from ASTM A-500 Grade B2 Structural Steel with two integral 20'-0" long beams, and two integral 10'-0" long girders, welded to corner columns. The steel perimeter frame of beams and girders are each 4" x 6" x 0.3125" tube section. The deck floor joists are 0.3125" x 6 " assembled, with a 0.25" position method, continuous fillet weld. The panels are load bearing, and the overall thickness is 6-inches by 10'-0" wide and 20'-0" long.

2.2 Materials

2.2.1 Panel Frame: Each individual Patio Deck Panel has two integral 20'-0" long beams and two integral 10'-0" girders. Each are 4" x 6" x 0.3125" tube sections of ASTM A-500 Grade B2 Structural Steel, and form the perimeter frame. The deck floor joists are 0.3125" x 6 " fastened, with a 0.25" position method, continuous fillet weld.

2.2.2 Panel Core: The core is a Class I Foam closed cell.

2.2.3 Underlayment: Underlayment is not needed because it is an impervious seamless deck. The Interior facing / surface is _" gypsum board. The exterior facing is the weathering surface, and is a 0.13" panel with a Class 1 flame spread classification and a smoke density not exceeding 450 in accordance with Section 802.2 of the UBC.

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April 11, 2006
PDG Domus 060323-1
Supporting report.
MTR

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2.2.4 Fasteners: The fasteners used to attach the floor face panel to the floor joists are 0.25" position welds. The type is "intermittent equal fillet welds – 1-inch every 9-inches, to the 6-inch floor joists. The floor joists are welded to the 4" x 6" tube steel frame with 0.25-inch position method continuous fillet welds on each side of the joist.

2.2.4 Installation:
The exterior facing is the weathering surface, and is a composite panel affixed to tapered _" to 2" rigid insulation, in the 10'-0" direction, having a Class I flame spread classification and a smoke density not exceeding 450 in accordance with Section 802.2 of the UBC. With the attachment of the drywall ceiling panel, all of the elements forms a rectangular cell.

2.4 Roof Classification: Allowable Loads:

The Tables on Drawing # S-9 lists the Floor Load Design Criteria for the Deck to be 1 / 360 for deflection and supports the Live Load of 100 psf.

2.5 Wind Resistance:

In jurisdictions enforcing the IRC, and when installed in accordance with this report, the Patio Deck may be installed in areas subject to a maximum basic (fastest mile) wind speed of 80 mph (129 km/h), on structures a maximum of 40 feet (12 192 mm) in height, in Exposure B areas.

In jurisdictions enforcing the IRC, and when installation is in accordance with this report, the Patio Deck may be installed on areas subject to a maximum basic wind speed (3-second gust) of 100 mph (161 km/h) on structures having a mean roof height of 40 feet (12 192 mm), in Exposure B areas.

2.6 Identification:

Each Patio Deck panel / cell is identified by a label indicating the name of the manufacturer, (pdgDOMUS), product name and type, foam plastic insulation type, facing gage / thickness, names of the quality control agencies, flame-spread and smoke developed ratings, and the ICBO ES evaluation report number.

3 EVIDENCE SUBMITTED:

Data in accordance with the ICBO ES Acceptance Criteria for Special Roofing Systems (AC07), dated January, 2002 and a quality control manual.

3.1 Tests:

Due to thickness and it is not a "Foldable" or "Rollable" membrane, only certain tests were applied were for Strength and Permeability Test.

3.2 Wind Resistance Test #1504.3:

The patio deck materials resist wind loads. The other tests outlined in AC07 (Special Plastic Roofs), are inapplicable for nominal thickness for "Foldable" and "Rollable" flat roofs.

April 11, 2006
PDG Domus 060323-1
Supporting report.
MTR

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3.2 Strength Test – Impact resistance #1504.7

The patio deck assemblies were tested for deflection by Progressive Engineering, Inc. and they found the patio deck can substantially sustain a positive pressure, beyond the requirements as stated in their September 7, 2004 report.

3.3 Fire Classification Test-1505:

Has not been tested to determine a Fire Classification. Thus, limited to the requirements of ORC for 1,2, and 3-family, and Group R-3 and U occupancies, per IBC. ORC 901states that unclassified or when the edge of the (flat) roof is less than 3 feet from the property line.

3.4 Materials Specifications and Characteristics:

OBC Section 1506.3 states: "Roof covering materials shall conform to the applicable standards listed in this chapter. In the absence of applicable standards or where materials are of questionable suitability, testing by an approved testing agency shall be required by the building official to determine the character, quality and limitations of application of the materials."

OBC required testing is outlined above, and the only other direction provided by the code for the parameters of the testing for alternative systems lacking applicable standards within the OBC is in ICC-ES document AC07. This document outlines the testing requirements for various "special" roofing systems and materials, including plastic roof systems. This document exempts pdgDOMUS patio deck / flat roof products from some of its listed tests due to Ohio's lesser wind velocities, roof slope being below 60 degree angle, and the wearing surface not being over sheathing.

3.5 Uplift-bend Test AC07,3.2.3:

This is for roofs/decks greater than 60 degrees above horizontal, which does not apply to the pdgDOMUS model.

3.6 Temperature-cycling test, AC07,3.2.6

Since this is a synthetic material, with excessive thickness, Progressive Engineering, Inc., determined testing to be impractical when the conclusion of acceptable performance is too obvious.

3.7 Permeability test – AC07 Section 4.7:

Progressive Engineering, Inc. found the FRP Patio Deck materials to be substantially impervious to standing water, as stated in their September 16, 2004 report.

4 FINDINGS:

That the pdgDOMUS Patio Deck Roof has not been tested except for the AC07 Permeability Test on the deck cap material. The flat plastic roof deck system has no comparable in the code's roofing section. The applicant, pdgDOMUS, had this material tested for Permeability with success. Progressive Engineering, Inc., stated that this material is of excessive thickness, and will be applied seamlessly, thus precluding subjecting the material to the other tests listed in AC07.

STATE OF OHIO
ANTONIO COLOSIMO
6520
REGISTERED ARCHITECT

April 11, 2006
PDG Domus 060323-1
Supporting report.
MTR

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4.1 The Patio Decks are manufactured, identified and installed in accordance with this report and the manufacturer's instructions.

4.2 The Patio Decks are recognized for installation on new construction in areas as described in Section 2.5 of this report.

4.3 The Patio Decks are manufactured at the pdgDOMUS Manufacturing LLC facilities at 1909 E. Livingston Avenue, Rear, Columbus, Ohio 43209, under a quality control program with inspections by the Quality Auditing Department of the Industrial Units Division of the State of Ohio.

4.4 The Patio Decks are not to be installed in locations with wind velocities greater than 100 MPH or on surfaces greater than 40 feet above grade.

4.5 The Patio Decks system shall not be installed over spaced sheathing.

4.6 The Patio deck materials of the sloped shingle system will not be thinner than those used in the Progressive Engineering, Inc., AC07 Permeability Test.

4.7 The Patio deck material are limited to R-3, U and one, two and three family occupancies.

4.8 The Patio Deck materials will not be installed on decks or flat roofs closer than three (3) to a property line.

STATE OF OHIO
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April 11, 2006
PDG Domus 060323-1
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DIVISION: 07 THERMAL & MOISTURE PROTECTION

CATEGORY: **ROOF PANEL**

ALTERNATIVE BUILDING PRODUCT TESTS FOR R-3, U or 1-3 FAMILY

INTRODUCTION
The roofing and deck materials are manufactured by pdgDOMUS. The materials were tested per OBC Section 118, and a lab listed in Appendix O. The lab selected – Progressive Engineering, Inc. The OBC references for the scope of testing are from OBC Sections 1504, ICC-ES Acceptance Criteria and evaluation Guidelines document AC07, OBC Chapter 17, Section 1714, which also references OBC Chapter 16, Section 1604.3 for deflection limitations, and ORC Chapter 9.

This report for sloped and low roofs, similar to ICC ES ER – 6114, outlining materials involved in the roofing systems, and the installation method and requirements, sealed by Antonio Colosimo, Architect, State of Ohio, is submitted.

1.0 SUBJECT
PdgDOMUS "Slatelike" Roof Panels. (Note: "Slatelike" is the proposed market name for the pdgDOMUS proprietary finished roof system.

2.0 DESCRIPTION

2.1 General:

The pdgDOMUS Roof Panels are factory-assembled foam core sandwich panels with _--inch gypsum board on the interior face, and an in-house manufactured composite weathering surface. The panel frame is constructed from a steel plate perimeter with tube section rafters. The ridge beam is 0.5-inch x 6-inch x 23'-0" long flat plate steel, ASTM A-36; the rafter connection plate, (mark # 21 on drawing #7), is 0.5-inch x 5-inches x 23'-0", with a 0.3113" x 3.5" x 6.0" angle assembly. The rafters are 0.125" x 2.0" x 5.0" x nominal 8" assembled, with a 0.25" position method, continuous fillet weld. There is an 8-inch gable end extension at the roof-line for an aesthetic detail. The panels are load bearing, and a Class 1 closed-cell panel.

2.2 Materials:

2.2.1 Panel Frame: Each individual panel has an integral 23'-0" connection plate used to attach two roof sections together to form one side of the gable roof. girders as the perimeter of the panel frame, welded to corner columns. The ridge beams and connecting plates are ASTM A-36. The rafters are each 2"x 5" x 0.125 tube section, of ASTM A-500 Grade B2 Structural Steel, fastened to a 4" x 6" tube steel frame with 0.25-inch position method continuous fillet welds on each end of the rafters.

2.2.2 Panel Core: The core is a Class I Foam closed cell – polyurethane.

2.2.3 Underlayment: Underlayment is not needed because it is an impervious seamless deck. The Interior facing / surface is _" gypsum board. The exterior facing is the weathering surface, and is a 0.13" panel with a Class 1 flame spread classification and a smoke density not exceeding 450 in accordance with Section 802.2 of the UBC.

April 11, 2006
PDG Domus 060323-1
Supporting report.
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2.2.4 Slatelike: The slates are approximately 14" wide x 24'-0" long by 0.25 inch thick. The slates have two pre stamped depressed hole areas for fasteners. Installed weight is approximately one hundred (100) pounds per 100 square feet when installation is with a 10-inch exposure. *See Figure on Page 122-I of the pdgDOMUS Manufacturing Manual.* Accessories include hip and ridge caps manufactured from the same materials as the slates.

2.2.5 Fasteners: The fasteners used to attach the slates FRP material to the Panel are No. 20 gage by minimum 0.75 inch long. Fasteners used are corrosion-resistant.

2.3 Installation: The slates are installed over the Panel Deck at a minimum roof slope of 6:12 installed with self-tapping stainless or galvanized fasteners at 12 inches on center to the rafters, placed at the pre-molded holes. With the attachment of the drywall ceiling panel, all of the elements forms a rectangular cell.

2.3.1 Valleys and Ridges: Valleys are flashed with the same material as the roof shingles, pre-formed 0.25-inch thick material and attached with No. 20 fasteners, spaced 12-inches on center. Ridges are flashed in accordance with pdgDOMUS caps with a maximum 7-inch exposure, using 2 No. 20 galvanized self-tapping screws at 12-inches on center.

2.4 Roof Classification: Allowable Loads:

The Tables on Drawing # S-9 lists the Floor Load Design Criteria for the floor to be 1 / 360 for deflection and supports the Live Load of 40psf.

2.5 Wind Resistance:

In jurisdictions enforcing the IRC, and when installed in accordance with this report, the slates may be installed in areas subject to a maximum basic (fastest mile) wind speed of 80 mph (129 km/h), on structures a maximum of 40 feet (12 192 mm) in height, in Exposure B areas.

In jurisdictions enforcing the IRC, and when installation is in accordance with this report, the slates may be installed on areas subject to a maximum basic wind speed (3-second gust) of 100 mph (161 km/h) on structures having a mean roof height of 40 feet (12 192 mm), in Exposure B areas.

2.6 Identification:

Each panel / cell is identified by a label indicating the name of the manufacturer, (pdgDOMUS), product name and type, foam plastic insulation type, facing gage / thickness, names of the quality control agencies, flame-spread and smoke developed ratings, and the ICBO ES evaluation report number.

3 EVIDENCE SUBMITTED:

Data in accordance with the ICBO ES Acceptance Criteria for Special Roofing Systems (AC07), dated January, 2002 and a quality control manual.

STATE OF OHIO
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April 11, 2006
PDG Domus 060323-1
Supporting report.
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3.1 Tests:

Due to thickness and it is not a "Foldable" or "Rollable" membrane, only certain tests were applied were for Strength and Permeability Test.

3.2 Wind Resistance Test #1504.3:

The roofing materials resist wind loads. The other tests outlined in AC07 (Special Plastic Roofs), are inapplicable for nominal thickness for "Foldable" and "Rollable" roofs.

3.2 Strength Test – Impact resistance #1504.7

The sloped roof deck assemblies were tested for deflection by Progressive Engineering, Inc. and they found the fiberglass shingle panels and roof deck can substantially sustain a positive pressure, beyond the requirements as stated in their September 7, 2004 report.

3.3 Fire Classification Test-1505:

Has not been tested to determine a Fire Classification. Thus, limited to the requirements of Ohio Residential Code for 1,2, and 3-family, and Group R-3 and U occupancies, per IBC. ORC 901states that unclassified or when the edge of the roof is less than 3 feet from the property line.

3.4 Materials Specifications and Characteristics:

OBC Section 1506.3 states: "Roof covering materials shall conform to the applicable standards listed in this chapter. In the absence of applicable standards or where materials are of questionable suitability, testing by an approved testing agency shall be required by the building official to determine the character, quality and limitations of application of the materials."

OBC required testing is outlined above, and the only other direction provided by the code for the parameters of the testing for alternative systems lacking applicable standards within the OBC is in ICC-ES document AC07. This document outlines the testing requirements for various "special" roofing systems and materials, including plastic roof systems.

This document exempts pdgDOMUS roof products from some of its listed tests due to Ohio's lesser wind velocities, roof slope being below 60 degree angle, and the shingle not being over sheathing. Section 1506.3 note "…systems lacking applicable standards…" would not include the pdgDOMUS shingle roof, since it should be classified as a slate roof.

3.5 Uplift-bend Test AC07,3.2.3:

This is for roofs greater than 60 degrees above horizontal, which does not apply to the pdgDOMUS model.

3.6 Temperature-cycling test, AC07,3.2.6

Since this is a synthetic slate material, with excessive thickness, Progressive Engineering, Inc., determined testing to be impractical when the conclusion of acceptable performance is too obvious.

STATE OF OHIO
ANTONIO
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April 11, 2006
PDG Domus 060323-1
Supporting report.
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3.7 Permeability test – AC07 Section 4.7:

Progressive Engineering, Inc. found the FRP shingle and roof shingle materials to be substantially impervious to standing water, as stated in their September 16, 2004 report.

4 FINDINGS:

That the pdgDOMUS Slatelike roofing described in this report complies with the 1997 *Uniform Building Code,* the 2000 *International Building Code,* and the 2000 *International residential Code,* subject to the following conditions:

4.1 The slates are manufactured, identified and installed in accordance with this report and the manufacturer's instructions.

4.2 The slates are recognized for installation on new construction in areas as described in Section 2.5 of this report.

4.3 The slates are manufactured at the pdgDOMUS Manufacturing LLC facilities at 1909 E. Livingston Avenue, Rear, Columbus, Ohio 43209, under a quality control program with inspections by the Quality Auditing Department of the Industrial Units Division of the State of Ohio.

4.4 The roofs are not to be installed in locations with wind velocities greater than 100 MPH or on surfaces greater than 40 feet above grade. The shingled roof system shall not be installed over spaced sheathing.

4.5 The shingled roof system shall not be installed over spaced sheathing.

4.6 The FRP roofing materials of the sloped shingle system will not be thinner than those used in the Progressive Engineering, Inc., AC07 Permeability Test.

4.7 The sloped shingle roof material are limited to R-3, U and one, two and three family occupancies.

4.8 The sloped and shingled roof materials will not be installed on roofs closer than three (3) to a property line.

4.9 The shingled roof will not be used on surfaces greater than 60 degrees above horizontal.

This report is subject to re-examination in one year.

STATE OF OHIO
ANTONIO
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April 11, 2006
PDG Domus 060323-1
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