



Standard Practice for Installation of Roof Mounted Photovoltaic Arrays on Steep- Slope Roofs¹

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1. Scope

1.1 This practice details minimum requirements for the installation of roof mounted photovoltaic arrays on steep-sloped roofs with water-shedding roof coverings. These requirements include proper water-shedding integration with the roof system, material properties, flashing of roof penetrations, and sufficient anchoring per regional design load requirements.

1.1.1 This practice does not apply to building-integrated or adhesively attached photovoltaic systems that are applied as roof-covering components.

1.2 This practice does not cover the electrical aspects of installation.

1.3 Installation considerations are divided into two distinct aspects: the interface between the photovoltaic module and the array mounting structure, and the interface between the array mounting structure and the roof or roof structure.

1.4 Safety and hazard considerations unique to this application, such as worker fall protection, electrical exposure, accessibility of modules, and roof clearance around the perimeter of the array are addressed by other codes, standards, or authorities having jurisdiction.

1.5 This practice is intended to provide recommended installation practices for use by installers, specifiers, inspectors, or for specification by photovoltaic module manufacturers.

1.6 This practice provides minimum guidelines and should be used in conjunction with module and mounting system manufacturers' instructions. This practice offers a set of instructions for performing one or more specific operations. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice may be applicable in all circumstances. This ASTM Standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied

without consideration of a project's many unique aspects. The word "Standard" in the title means only that the document has been approved through the ASTM consensus process.

1.7 This practice is not intended to replace or supersede any other applicable local codes, standards or Licensed Design Professional instructions for a given installation.

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific hazards are given in Section 8.

2. Referenced Documents

2.1 ASTM Standards:²

D1079 Terminology Relating to Roofing and Waterproofing

D1761 Test Methods for Mechanical Fasteners in Wood

E136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

E772 Terminology of Solar Energy Conversion

2.2 AAMA Standards:³

AAMA 800 Voluntary Specifications and Test Methods for Sealants

2.3 ASCE Standards:⁴

ASCE 7 Minimum Design Loads for Buildings and Other Structures

2.4 IEC Standards:⁵

IEC 61730-1 (2004-10) Photovoltaic (PV) Module Safety Qualification-Part One: Requirements for Construction

¹ This practice is under the jurisdiction of ASTM Committee E44 on Solar, Geothermal and Other Alternative Energy Sources and is the direct responsibility of Subcommittee E44.09 on Photovoltaic Electric Power Conversion.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American Architectural Manufacturers Association (AAMA), 1827 Walden Office Sq., Suite 550, Schaumburg, IL 60173, <http://www.aamanet.org>.

⁴ Available from American Society of Civil Engineers (ASCE), 1801 Alexander Bell Dr., Reston, VA 20191, <http://www.asce.org>.

⁵ Available from International Electrotechnical Commission (IEC), 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, <http://www.iec.ch>.