



To: Building Owner

Re: Letter of Compliance – Photovoltaic (PV) Installation on Carlisle Warranted Roof

This letter outlines Carlisle's recommendations and requirements regarding the installation of Photovoltaic (PV) systems over a Carlisle-warranted roofing system. These recommendations and requirements facilitate the installation of the PV system with limited disturbance to the Carlisle roofing system. The determination of suitable PV technology, racking, and installation method is the responsibility of the Building Owner or its designated representative. Below are recommendations, along with conditions that may impact the Carlisle roofing system and warranty.

1. Determine the building's structural ability to withstand the PV system.
2. The roofing system must be protected during installation of the PV system to prevent damage. This includes staging and assembly areas, including heavily traveled areas.
3. Spray paint shall not be used to mark the layout of the PV system on the finished roof membrane. Instead, Carlisle recommends using crayons, which can be easily cleaned or removed.
4. Red chalk lines shall not be used, as they can permanently stain the finished membrane. Carlisle recommends using chalk of any color other than red.
5. To avoid PV system removal costs for the building owner, rack-supported PV systems should provide sufficient clearance, ensuring access to the roof membrane should maintenance or repairs be required.
6. Field seams that may be concealed by the PV system and challenging to access, should be overlaid by a roofing applicator authorized by Carlisle, using approved products, and following authorized installation procedures.
7. For non-penetrating ballasted PV racking systems, a protection course consisting of Carlisle's Pressure-Sensitive Molded Walkway Pads is required between the PV support system and the roofing membrane. Walkway pads of thickness and density equal or greater to those which can be provided by Carlisle may be used to prevent damage to the roofing membrane.
8. Non-penetrating attachment methods, relying solely on adhesive or heat welded attachment for anchoring to a thermoplastic membrane, should not be considered for direct application to the Carlisle roof membrane. Anchoring systems, whether used as a primary or ancillary securement method, should tie directly to a structural component of the building. Relying solely on the roof membrane attachment to secure the PV system may result in premature failure of the roof system assembly and would not be covered under the terms of the Carlisle Total System warranty.
9. PV laminates should not be adhered directly to the primary Carlisle roof membrane. Instead, PV laminates should be adhered to a compatible Carlisle membrane serving as a protection sheet, adhered, or welded to the primary roof membrane.
10. Walkway pads, protection pads, slip sheets and sacrificial sheets shall be of the same color as the roofing membrane.
11. Racking systems that require penetration of the roofing membrane are to be flashed in accordance with appropriate Carlisle published details. Flashing details must be performed by a Carlisle authorized roofing applicator.

Carlisle recommends that solar racking be anchored to the building's structure and promotes the use of Anchor Products U2400 and U3400 anchors to ensure compatibility with EPDM, TPO, PVC, and KEE HP membranes when applicable Carlisle flashing material is used. The seam between the solar anchor flashing and the Carlisle roofing system qualifies for warranty inclusion when installed by a Carlisle Authorized Applicator.

It is recommended that areas frequently accessed, for the purpose of operation or maintenance of the PV system, be protected by walkways installed in accordance with the Carlisle published application criteria. Should Carlisle be contacted to investigate a warranty claim or to make warranty related repairs, it is the Building Owner's responsibility to provide access to the membrane including the removal and replacement of the PV System. Only Carlisle brand products are covered by the Carlisle Warranty. Carlisle specifically disclaims liability, under any theory of law, for damages sustained by or caused by non-Carlisle brand products.

The following form lists the roofing inspections during the PV system installation to ensure continuation of the Carlisle Warranty. Upon completion of the roof alteration, an inspection must be scheduled and performed by a Carlisle Field Service Representative.



Solar Pre-Installation Form

This form must be completed by the building owner or the building owner's authorized representative prior to solar array installation. Submission of this form, along with a roof plan identifying the proposed location of the solar array, is required.

Field Assessment & Inspection Fees

For new warranted roofs, the roofing applicator must complete the final inspection for warranty, make any necessary repairs and pay any warranty fees prior to solar installation.

A roof inspection after PV system installation is required (Post Inspection). Please be advised that if the Post Inspection is not approved, warranty service will be suspended until repairs are made and a re-inspection completed and approved by a Carlisle Field Service Representative.

For solar installed on a new roof (w/in 1 year of roof completion) the post-solar installation inspection fee will be the same as a standard re-inspection (\$750). For existing roofs (older than 1 year) inspection fee is \$.05 per square foot of the entire roofing system as listed on the original warranty application (minimum fee of \$750). Inspection fees must be pre-paid via credit card or check prior to being scheduled.

Job #/Warranty #:

Building Name & Address:

Building Owner Contact Name (printed):

Phone:

Email:

Onsite Inspection Contact Name:

Phone:

Solar Company Name & Address:

Solar Company Contact:

Phone:

Email:

PV System Square Footage:

Name/Address of Carlisle Approved Applicator assisting:

Anchor/Mounting System Type:

U-Anchor 2400 with Carlisle Flashing

U-Anchor 3400 with Carlisle Flashing

Other

Warranty Document

Upon inspection and acceptance, and payment of all fees, a warranty continuance letter will be issued by Carlisle to the Building Owner. The continuance letter will outline additional warranty terms and should be retained along with the original warranty for future reference.

Please feel free to contact us at 877-797-8370 option 2 with questions.

Return this form via email to: PVLOC-WarrantyServices@CarlisleCCM.com



Preparing for Roof-Mounted Photovoltaic Installations

A. General

Information included in this document is to be used as a guideline for consideration when a Photovoltaic (PV) system is to be installed on top of a new or an existing Carlisle roofing system.

A PV installation will subject the roofing assembly to extensive alteration work and an increase in rooftop traffic for the purpose of monitoring and maintaining the PV array(s). When assessing a roof assembly for a possible PV installation, consideration must be given to not only operation of the PV system, but also to the accessibility of the roofing assembly including all detail work, as well as the drainage system, in order to perform adequate inspections, maintenance and repair.

Whenever additional loads are placed on a building or modifications are made to existing roofing systems, prudent best practices mandate a comprehensive review by a licensed design professional. Prior to committing to or proceeding beyond a preliminary design of a PV system, a structural analysis by a registered Professional Engineer should be performed to ensure structural load limitations will not be exceeded.

Climatic and geological conditions, structural load limitations, module tilt, roof height, the racking/mounting method, frequency of membrane penetration, and roof slope should all be taken into consideration.

B. Design Considerations

In addition to the design considerations outlined in each of the Carlisle published roofing system specifications, listed below are additional design recommendations which should be considered prior to a PV system being installed on a new or an existing Carlisle roof.

The proposed design may be presented to Carlisle for assessment and specific recommendations, but at no time will Carlisle approve or warrant any PV system design. It is the building owner's, by its retained design professional, responsibility to ensure the roofing membrane is adequately protected during construction of the PV array and throughout the serviceable lives of both the PV and roofing systems.

1. It is Carlisle's recommendation that roofs expecting an immediate PV system installation and roofs being installed as 'PV ready', should specify the use of an adhered rigid insulation board, e.g. DensDeck, SECUROCK or SecurShield HD, and an adhered membrane of sufficient thickness as to match the expected warranted life of a PV system (i.e. if the PV system is expected to be in use for 30 year, install a roof system with a 30 year warranty). The use of a highly fire-resistant components is also recommended, such as PVC membranes, gypsum cover boards, and assemblies tested to meet UL Class A.
2. On projects with an existing Carlisle roofing membrane, membrane condition and installation details should be assessed to determine possible splice overlayment or the removal and replacement of certain membrane sections. A Roof assessment should be performed by a Carlisle Authorized Applicator prior to finalizing any or all upgrades/repairs to the existing roofing system.
3. Rack-supported PV systems should provide sufficient clearance, ensuring access to the roof membrane should maintenance or repairs be required.



4. When penetration of the membrane is required to secure a racking system to the roof deck or building structure beneath the roofing membrane, the use of circular steel tubing will provide the best possible flashing option and facilitate the use of pre-molded accessories. In such instances, Carlisle specifications and details must be followed and the flashing performed by a Carlisle Authorized Applicator to ensure suspension of warranty service does not occur.
5. Carlisle promotes the use of Anchor Products U2400 and U3400 anchors to ensure compatibility with EPDM, TPO, PVC, and KEE HP membranes when applicable Carlisle flashing material is used. The seam between the solar anchor flashing membrane and the Carlisle roofing system qualifies for warranty inclusion when installed by a Carlisle Authorized Applicator.
6. Areas of the roofing membrane, which are heavily traveled during array installation and subsequent periodic maintenance, should be protected with walkway pads and/or concrete pavers. If pavers are selected, they should be used in conjunction with pedestals or sections of walkway pads, used to elevate the pavers. Refer to the appropriate Carlisle Spec Supplement for more information on paver installation.
7. Ballasted PV systems should utilize protection pads between the ballast trays and the roofing membrane to provide protection and facilitate drainage. A protection course shall be of sufficient construction so as to prevent contact between any component of the PV racking system and the roofing membrane for the life of the roofing system. Examples of protection courses are Carlisle's Sure-Weld TPO Walkway Roll, Sure-White Molded Walkway Pad or a component supplied by the racking system manufacturer. Any component supplied by the racking system manufacturer and its interaction with Carlisle's roofing system will not be covered under the Carlisle warranty.
8. Non-penetrating attachment methods, relying solely on adhesive or heat welded attachment for anchoring to a thermoplastic membrane, should not be considered for direct application to the Carlisle roof membrane. Anchoring systems, whether used as a primary or ancillary securement method, should tie directly to a structural component of the building. Relying solely on the roof membrane attachment to secure the PV system may result in premature failure of the roof system assembly and would not be covered under the terms of the Carlisle Total System warranty.
9. PV laminates should not be adhered directly to the primary Carlisle roof membrane. Instead, PV laminates should be adhered to a compatible Carlisle membrane serving as a protection sheet, adhered, or welded to the primary roof membrane.
10. In order to minimize interruptions to a PV system's production, it is strongly recommended to position the array(s) so that field seams and penetrations are accessible for roofing inspections, maintenance and repair. When not feasible, all existing seams should be overlaid (stripped in) with pressure-sensitive flashing or other acceptable flashing details approved by Carlisle.

C. Warranty Inspections

1. All roofing and flashing work shall be completed by a Carlisle Authorized Applicator and must be performed in accordance with Carlisle specifications or previously issued roof assessment reports written by a Carlisle Field Service Representative.
2. Upon completion of the work, and notification by a Carlisle Authorized Applicator, an inspection will be performed by Carlisle to assess the work performed. Upon inspection and acceptance, and payment of all fees, a warranty continuance letter will be issued by Carlisle to the Building Owner. The continuance letter will outline additional warranty terms and should be retained along with the original warranty for future reference.
3. All field inspections are conducted by Carlisle for a fee. Should multiple inspections be required, a fee will be charged for each occurrence.



- For new roofs the inspection fee will be equivalent to a standard "re-inspect fee", typically \$750 per inspection, and must be paid prior to the inspection.
- For existing warranted roofs the inspection fee will be \$.05 per square foot based on warranted square footage (\$750 minimum) and must be paid prior to the inspection.

D. Warranties

Installation of a PV system will subject the roofing membrane to excessive traffic during installation, operation, and maintenance of the PV array(s). Access for membrane repairs may require the dismantling of panels and/or the removal of modules; therefore, it is important to enhance the membrane system durability to minimize the potential for damage or the probability of leaks.

For new or existing projects, the Carlisle roof system warranty will only cover deficiencies in Carlisle-supplied material or labor performed by the Carlisle Authorized Applicator associated with the installation of those materials.

1. Damages to the roofing system resulting from PV operation or maintenance are beyond the coverage of any new or existing Carlisle warranty.
2. Should the dismantling of panels and/or the removal of modules be required to complete repairs covered by the membrane system warranty, costs associated with removal and replacement and any increase in repair costs due to limited access shall be the owner's responsibility and are not covered by the warranty. Owner shall be responsible for all costs associated with any loss of power generation in the event that removal of a solar array is required to repair the roofing system.

E. Quality Assurance

The building owner, by its designated design professional should coordinate through the Authority Having Jurisdiction (AHJ) to ensure compliance with all applicable codes.

When selecting a PV system, the PV module manufacturer should be consulted to verify that the use of their product will not adversely impact the fire code classification of the roof assembly.

F. Cautions & Warnings

Please note that this list is not an exhaustive one:

1. Areas designated for staging of roofing or restoration materials and PV array components prior to construction must be protected to prevent damage to the membrane or the insulation below.
2. Maximum distributed, lateral and point loads should be determined by the building owner or his/her design professional to avoid exceeding the maximum compressive strength of the roofing assembly or the maximum loads for which the structure is designed.
3. Coordination between various trades (Carlisle Authorized Applicator and PV system installer/electrician) is essential to minimize delays, avoid unnecessary rooftop traffic over/through completed sections, prevent excessive soiling of highly reflective membranes and avert possible physical damage to the roofing membrane.



4. On new or existing membrane installations, attachment of slip-sheets, walkway pads, sacrificial sheets and all necessary flashings/terminations or modification to the roofing assembly must be performed by a Carlisle Authorized Applicator. Failure to comply will result in negating the issuance of a membrane system warranty or suspension of all warranty service to existing warranties.
5. Non-penetrating attachment methods, relying solely on adhesive or heat welded attachment for anchoring to a thermoplastic membrane, should not be considered for direct application to the Carlisle roof membrane. Anchoring systems, whether used as a primary or ancillary securement method, should tie directly to a structural component of the building. Relying solely on the roof membrane attachment to secure the PV system may result in premature failure of the roof system assembly and would not be covered under the terms of the Carlisle Total System warranty.
6. Walkway pads, protection pads, slip sheets and sacrificial sheets shall be of the same color as the roofing membrane.
7. Carlisle will not warrant or approve the integrity, installation or performance of any PV system or PV system component.

Carlisle is a trademark of Carlisle. DensDeck is a registered trademark of Georgia-Pacific.
SECUROCK is a registered trademark of USG.