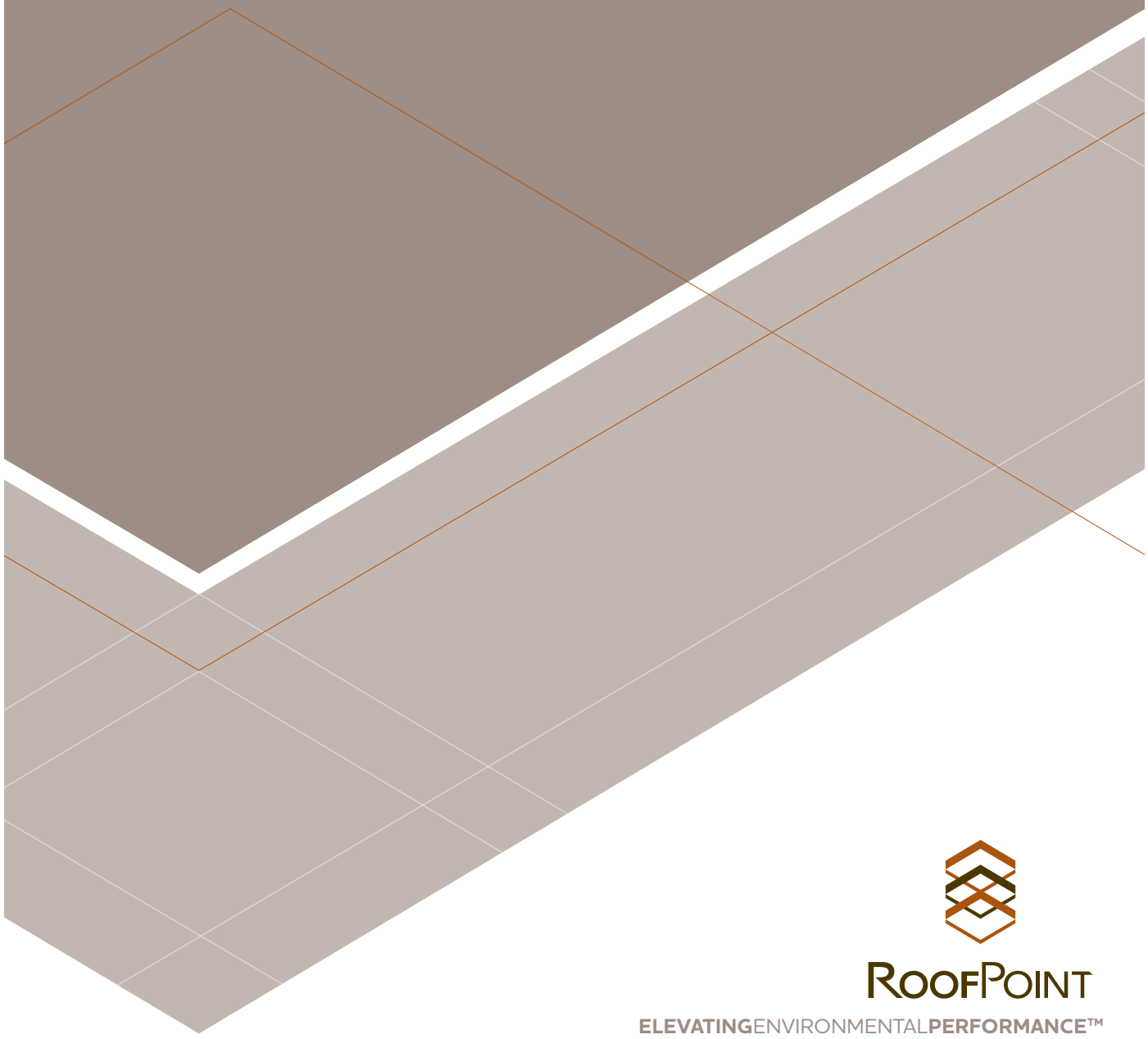
ROOFPOINT™
GUIDELINE FOR ENVIRONMENTALLY INNOVATIVE NONRESIDENTIAL ROOFING



RoofPoint

ELEVATINGENVIRONMENTALPERFORMANCE™

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< INTRODUCTION >

ROOFPOINT IS A VOLUNTARY, CONSENSUS-BASED PROGRAM DEVELOPED BY THE CENTER FOR ENVIRONMENTAL INNOVATION IN ROOFING WITH INPUT FROM REPRESENTATIVES OF IMPORTANT NON-PROFIT STAKEHOLDER GROUPS REPRESENTING ROOFING CONTRACTORS, ROOF CONSULTANTS, ROOFING MATERIAL MANUFACTURERS AND ROOFING RESEARCH ORGANIZATIONS. ROOFPOINT IS DESIGNED TO EVALUATE BOTH NEW AND REPLACEMENT ROOFS FOR COMMERCIAL AND INSTITUTIONAL BUILDINGS. USING CURRENT STATE-OF-THE ART AS A BASELINE, ROOFPOINT PROVIDES A MEANS TO EVALUATE ROOF SYSTEM ENVIRONMENTAL PERFORMANCE OVER THE LIFE CYCLE OF THE BUILDING IT COVERS, PROVIDING A USEFUL MEASURE FOR WHAT CONSTITUTES A SUSTAINABLE ROOF IN DESIGN, CONSTRUCTION, OPERATION AND DECOMMISSIONING.

Mission and Objectives

The mission of RoofPoint is to provide a means of roof system selection across system types and designs so that the roofing industry as a whole is recognized for the diversity of environmentally responsive options it offers to meet the needs of concerned building owners. RoofPoint is intended to serve as a cornerstone for the design and selection of environmentally innovative roofing systems. To fulfill this mission, the RoofPoint Guideline has been designed to meet the following goals:

- The Guideline is designed to be easy to understand and use.
- The Guideline reflects current green building thinking by incorporating established criteria and measurements from existing green building standards.
- The Guideline is designed for tangible value: a reliable guide to help building owners make effective decisions, a useful template for developing education and outreach programs, and a valuable tool for validating the decisions of design and construction professionals.
- The Guideline is designed to evolve into a recognized national consensus standard so it can be formally integrated into public construction specifications and requirements.

INTRODUCTION

Organization of the Guideline

RoofPoint for Environmentally Innovative Nonresidential Roofing is organized into five functional areas representing the primary environmental contributions of modern commercial roofing systems:

- Energy Management
- Materials Management
- Water Management
- Durability / Life Cycle Management
- Environmental Innovation in Roofing

Each functional area of RoofPoint is further organized into a series of credits based on critical determinants of each primary environmental function. In order to transform these critical determinants into actionable aspects of roof system selection, installation and operation, the following information is provided for each credit:

- Intent. The intended result for each credit is stated in terms of a desired environmental performance outcome.
- Requirements. The effective fulfillment of the intent is identified as a measurable objective. Some requirements may be identified as prerequisites and other requirements may identify different levels of performance.
- Technologies and Strategies. A brief discussion of technologies and practices available to meet the requirements

Assessment and Weighting

Currently, RoofPoint credits are evaluated using the following assessment classifications:

- Meets Intent. The project fulfills the broad intent of the credit although specific conditions of the project do not support full compliance with the credit requirement. (1 Point per Credit)
- Meets Requirement. The roof system meets the credit requirement. (1 Point per Credit)
- Exceeds Requirement. The roof system substantially exceeds the credit requirement and provides a tangible benefit by exceeding the requirement. *(1.5 Points per Credit)*

To be eligible for inclusion in the RoofPoint program, a minimum total score of 12 points must be achieved, with a minimum of at least 3 points in the Energy category, at least 2 points in the Materials/Water categories, and at least 4 points in the Durability/Life Cycle categories. A sample Checklist is provided in Appendix A.

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Ongoing Review and Update

RoofPoint is intended to be a living document, and this guideline will be reviewed and updated as directed by the RoofPoint governing body.

A Note Regarding Building Code Compliance

Building codes play a vital role in assuring the integrity of buildings and the safety of their occupants, and code-approved roofing systems are an integral part of national and local building codes. In addition to meeting or exceeding requirements specified in this Guideline, all roofing systems and their components must also be code-compliant. In addition, all roofing systems shall be installed to meet or exceed all applicable building code requirements, including but not limited to requirements for fire resistance, wind and storm resistance, durability and safety.

A Note Regarding Manufacturer Recommendations

Modern roofing systems are frequently based on integrated, proprietary system assemblies developed by roofing system manufacturers, and the majority of commercial roofing systems are covered by roof system manufacturer limited warranties. Accordingly, it is important that roof system manufacturer recommendations be followed in addition to the requirements of this guideline in order to assure effective material and installation integration as well as maintain the validity of limited warranties that may be issued.

< SECTION AND CREDIT INDEX >

Section 1: Energy Management

Section 2: Material Management

Section 3: Water Management

Section 4: Durability / Life Cycle Management

Section 5: Environmental Innovation In Roofing

SECTION 1: ENERGY MANAGEMENT: E1 HIGH R ROOF SYSTEM

Intent

Achieve levels of roof-related energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy.

Requirement E1a: High R Value

The minimum average thermal resistance (R-value) of the roofing system shall meet or exceed the following minimum requirements:

ROOF CONFIGURATION	CLIMATE ZONE[4]			
	ZONE 1	ZONE 2-5	ZONE 6	ZONE 8
ROOF WITH INSULATION ENTIRELY ABOVE DECK				
CONDITIONED SPACE[1]	R-20[5]	R-25[5]	R-30[5]	R-35[5]
SEMI-HEATED SPACE[1]	R-7.6[5]	R-7.6[5]	R-15[5]	R-15[5]
STRUCTURAL METAL ROOF[2]				
CONDITIONED SPACE[1]	R-19 + R-11[6]	R-19 + R-11[6]	R-19 + R-11[6]	R-19 + R-11[6]
SEMI-HEATED SPACE[1]	R-19	R-13 + R-19	R-13 + R-19	R-13 + R-19
ATTIC AND OTHER[3]				
CONDITIONED SPACE[1]	R-38	R-49	R-49	R-60
SEMI-HEATED SPACE[1]	R-19	R-30	R-38	R-38

Notes

1. Conditioned and Semi-Heated Space as defined in the most recent edition of ASHRAE 90.1.
2. A roofing system in which metal roof panels serve as both the primary roof surface as well as the roof deck spanning the structural framing.
3. All other roofs, including roofs with insulation entirely below the roof structure and roofs with insulation both above and below the roof, as defined in the most recent edition of ASHRAE 90.1.
4. Climate Zone as identified by the climate zone map in the most recent edition of ASHRAE 90.1.
5. Continuous insulation (ci) above the roof deck.
6. Installed as a liner system (Ls) in which a continuous membrane is installed below the purlins and uninterrupted by framing members. The first rated R-value refers to uncompressed, unfaced insulation resting on top of the membrane between the purlins. The second rated R-value refers to unfaced insulation draped over purlins and then compressed when the metal roof panels are attached. In addition, a minimum R-3 thermal spacer block between the purlins and the metal roof panels shall be installed.

SECTION 1: ENERGY MANAGEMENT: E1 HIGH R ROOF SYSTEM

Calculating R-Value

Calculation of actual roof system R-value shall be based on definitions and procedures as identified in the most recent edition of ASHRAE 90.1.

Coordination with Credit D6 Construction Moisture Management

Whenever an existing roofing system is recovered, the R-value of the existing roof insulation remaining in place may be included in the R-value calculation provided that Credit D6 Construction Moisture Management is also included as part of the roofing system application.

E1 High R Roof System: Technologies and Strategies

The minimum R-values in the table may be achieved by many different low-slope roofing systems using a variety of thermal insulating materials. Chapter 2 of the most recent edition of the NRCA Roofing Manual: Membrane Systems provides an excellent overview of modern roof insulation, including types and desirable properties of roof insulation. The NRCA "EnergyWise" or similar energy calculator also may be used to explore different material and system options.

In re-roofing applications, building HVAC systems may also need to be upgraded to achieve maximum benefit from the required R-values listed above. In addition, roof insulation upgrades should be recorded as part of the comprehensive Roof Inspection / Maintenance Manual required in Credit L1.

SECTION 1: ENERGY MANAGEMENT: E2 BEST THERMAL PRACTICES

Intent

Maximize the value of thermal roof insulation through design and installation practices that minimize thermal discontinuities within the roofing system.

Requirement E2a: Multiple Layer Insulation

If above-deck board insulation is used to meet thermal insulation requirements, install the insulation boards in two or more layers with staggered joints.

Requirement E2b: Thermal Discontinuities

Install the roof system using any of the following options to further minimize thermal discontinuities in the roof insulation:

- Mechanically fasten the bottom layer(s) of the board insulation and install the upper layer(s) using a code-approved insulation adhesive.
- Attach all layers of roof insulation using code-approved non-thermal bridging mechanical fasteners.
- Install the insulation layers without mechanical fasteners using a ballasted or protected membrane system.
- Install the insulation monolithically using spray polyurethane foam (SPF), lightweight insulation concrete or similar technology.

Technologies and Strategies

The value of thermal roof insulation can be optimized by minimizing gaps, voids and other discontinuities within the overall insulation assembly. This can be accomplished using a variety of techniques suitable to many different types of low-slope roofing systems.

The requirement to install roof insulation boards in two or more layers typically is necessary as a practical matter to achieve the overall R-value requirements of Credit E1. Chapter 2 of the most recent edition of the National Roofing Contractors Association (NRCA) Roofing Manual: Membrane Systems recommends multiple layers of insulation whenever the total roof insulation thickness exceeds 2 inches. The most recent edition of the NRCA manual as well as other industry guidelines also recommend that each layer of roof insulation not exceed a specified maximum thickness, depending on insulation type and the particular industry guideline. Accordingly, the roof system designer is encouraged to review these maximum board thickness recommendations and to incorporate maximum insulation board thickness criteria in the roofing project specification.

SECTION 1: ENERGY MANAGEMENT: E3 ROOF SURFACE THERMAL CONTRIBUTION

Intent

- Optimize net annual building energy efficiency.
- Optimize building peak energy demand during the cooling season.
- Reduce heat island effects and associated impacts on microclimates and human and wildlife habitats.

Requirement E3a: Optimize Net Annual Energy Efficiency

Optimize net energy efficiency by installing one or a combination of the following roof surfaces:

CLIMATE ZONE[1]	ROOF SURFACE
1-3	A. HIGH ALBEDO[2]
	B. BALLASTED[5]
	C. VEGETATED[6]
4	A. HIGH ALBEDO[2]
	B. MEDIUM ALBEDO[3]
	C. BALLASTED[5]
	D. VEGETATED[6]
5-6	A. HIGH ALBEDO[2]
	B. MEDIUM ALBEDO[3]
	C. LOW ALBEDO[4]
	D. BALLASTED[5]
	E. VEGETATED[6]
7-8	A. MEDIUM ALBEDO[3]
	B. LOW ALBEDO[4]
	C. BALLASTED[5]
	D. VEGETATED[6]

Note

As an alternate to the prescriptive requirements identified above, the roofing designer may choose a roof surface based on a whole-building energy analysis using DOE-2 or similar energy modeling software.

SECTION 1: ENERGY MANAGEMENT: E3 ROOF SURFACE THERMAL CONTRIBUTION

Requirement E3b: Optimize Peak Energy Demand

Optimize peak energy demand during the cooling season by installing one or a combination of the following roof surfaces:

CLIMATE ZONE[1]	ROOF SURFACE
1-8	A. HIGH ALBEDO[2]
	B. BALLASTED[5]
	C. VEGETATED[6]

Note

As an alternate to the prescriptive requirements identified above, the roofing designer may choose a roof surface based on a whole-building energy analysis using DOE-2 or similar energy modeling software.

Requirement E3c: Reduce Heat Island Effects

Reduce heat island effects and associated impacts by installing one or a combination of the following roof surfaces:

CLIMATE ZONE[1]	ROOF SURFACE
1-8	A. HIGH ALBEDO[2]
	B. VEGETATED[5]

Notes

1. High Albedo Roof: Solar Reflectance Index (SRI) greater or equal to 78 and 3-year aged SRI greater or equal to 64*
2. Medium Albedo Roof: New or aged SRI greater than 20 and less than 64.
3. Low Albedo Roof: New or aged SRI less than or equal to 20.
4. Ballasted roof:
   a. Zones 1 through 3: Minimum 22 lbs. / sq. ft. meeting California Title 24
   b. Zones 4 through 8: Minimum 15 lbs. / sq. ft. meeting Chicago Energy Code
5. Vegetated Roof meeting requirements of RoofPoint Credit W1.

SECTION 1: ENERGY MANAGEMENT: E3 ROOF SURFACE THERMAL CONTRIBUTION

**Or a 3-year aged Solar Reflectance (SR) greater or equal to 0.55 and a Thermal Emittance (E) equal or greater than 0.75. If testing for 3-year aged reflectance is not available for the roofing product, the 3-year aged value shall be derived from the initial value using the equation Raged = [0.2+0.7[pinitial-0.2], Where pinitial = Initial Solar Reflectance.*

Technologies and Strategies

The selected roof surface may incorporate a variety of available technologies, including reflective and non-reflective roof membranes and coatings as well as roof vegetation and ballast. The selection of the best roof surface for any particular building depends on a variety of factors, including local climate, building energy demands and intended roof service functions.

Note Regarding Surface Reflectivity and Aging. Industry research suggests that high albedo roof surfaces tend to lose a portion of initial reflective value over time. However, these studies also suggest that levels of reflectivity after 3 or 4 years meet or exceed accepted aged reflectivity requirements. Actual aged surface reflectivity for a particular roof surface may be affected by a number of factors, including local emission sources, dust and dirt accumulation, and amount /effectiveness of rain to clean the surface. In some situations, periodic cleaning of the roof surface may provide a benefit by increasing net surface reflectivity, but cleaning should only be conducted in accordance with the roof system manufacturer's recommendations and limitations.

SECTION 1: ENERGY MANAGEMENT: E4 ROOF AIR BARRIER

Intent

Maximize the thermal contribution of the roofing system by restricting air movement and related thermal transfer through the roofing system.

Requirement E4a: Roof Air Barrier

Install a roof system air barrier conforming to the following requirements:

- The air barrier shall be continuous throughout the roof surface, with all joints and seams sealed and with sealed connections between all transitions in planes and changes in materials and at all penetrations.
- The air barrier shall be joined and sealed in a flexible manner to the air barrier component of adjacent building envelope assemblies, allowing for the relative movement of these assemblies and components.
- The air barrier shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the air barrier without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.
- The air barrier shall be installed in accordance with the manufacturer's instructions and in such a manner as to achieve the performance requirements.
- Where roof-mounted equipment and penetrations are to be installed in such a way as to penetrate the continuous air barrier, provisions shall be made to maintain the integrity of the continuous air barrier.

Compliance of the continuous air barrier for the roof system shall be demonstrated by the application of prescriptive or performance standards for roof air barrier materials or roof air barrier assemblies or the performance standards for whole building envelopes as required by ASHRAE 189.1-2009 or similar sustainable building standards.

Technologies and Strategies

Infiltration of air into roofing systems may have serious consequences beyond building energy loss. Untreated infiltrating air may introduce pollutants, allergens, and bacteria into buildings. Infiltrating air may also produce moisture condensation, leading to conditions such as mold growth and corrosion, which in turn may lead to occupant health problems and premature building deterioration.

Although the installation of an air barrier is presented as an optional Credit within RoofPoint, there are many situations where an air barrier should be considered mandatory by the roofing designer. These situations include 1) external and internal climate conditions that may facilitate excessive moisture condensation and 2) roof system attachment methods, building configuration factors and local wind conditions that may produce excessive pressurization of the roofing system.

SECTION 1: ENERGY MANAGEMENT: E5 ROOFTOP ENERGY SYSTEMS

Intent

Use rooftop renewable energy (solar, wind, solar thermal) to generate a portion of the building's energy requirements:

Requirement E5a: Rooftop Energy Systems

Install one or more of the following rooftop energy alternatives:

- Solar Photo-Voltaic (PV). Install a roof-mounted or roof-integrated photo voltaic system with a minimum STC power rating of at least 10 KW.
- Solar Thermal. Install a roof-mounted solar thermal system generating a portion of building hot water requirements with a total collector panel area of at least 60 sq. ft.
- WIND. Install roof-mounted wind power unit(s) with a total Instantaneous Power Rating (IPR) at 28 mph of at least 10 KW.

Requirement E5b: Roof Energy-Ready Roof

As an alternative to installing a rooftop energy option, install a roofing system suitable for future installation of a specific renewable energy technology (or technologies), as documented by the roofing system manufacture's agreement to continue the originally-issued roof warranty coverage after the installation of the renewable energy system(s) at a later date, subject to the terms and conditions of the roofing manufacturer's warranty.

Coordination with Credit D1 Durable Roof Insulation, Credit D3 Roof Traffic Protection and Credit L1 Roof Maintenance Program. Because rooftop energy systems require frequent maintenance and associated roof traffic, credits available under this section are allowed only if L1 Roof Maintenance Program and D4 Roof Traffic Protection are also included as part of the roofing system application. In addition, Credit D1 Durable Roof Insulation must be included if the rooftop energy system is supported directly or indirectly on the roof insulation.

Special Note. In order to qualify for Credit E5, the installation of the rooftop energy system or energy-ready system must be installed or coordinated by a roofing professional knowledgeable in the integration of rooftop energy with the selected roofing system. In particular, the following roofing industry guidelines shall be incorporated into the design and installation of the rooftop energy system:

- "Guidelines for Roof-Mounted Photovoltaic System Installations" (NRCA, 2009)
- "Successful Rooftop Photovoltaics: How to Achieve A High-Quality, Well-Maintained, Compatible Rooftop PV System." (CEIR, 2009)

SECTION 1: ENERGY MANAGEMENT: E6 ROOF DAYLIGHTING

Intent

Use rooftop daylighting to supply a portion of building lighting requirements.

Requirement E6a: Basic Daylighting[1]

Install a roof daylighting system that provides the minimum daylight illumination level listed in the following table in a minimum of 75% of all regularly occupied areas directly beneath the roof area.

TYPE OF OCCUPANCY	MINIMUM FOOT CANDLES
OFFICES & CLASSROOMS	25 FC
RETAIL & OTHER COMMERCIAL	25 FC
LIGHT MANUFACTURING	25 FC
WAREHOUSING	10 FC

[1]Basic Daylighting is not integrated with photo controls for the building artificial lighting system.

Requirement E6b: Controlled Daylighting[2]

Install a roof daylighting system that provides the minimum daylight illumination level listed in the following table in a minimum of 75% of all regularly occupied areas directly beneath the roof area.

TYPE OF OCCUPANCY	MINIMUM FOOT CANDLES
OFFICES & CLASSROOMS	25 FC
RETAIL & OTHER COMMERCIAL	25 FC
LIGHT MANUFACTURING	25 FC
WAREHOUSING	10 FC

[2]Controlled Daylighting is fully integrated with photo controls for the building artificial lighting system so that interior lights automatically turn off or dim when daylighting is available.

SECTION 1: ENERGY MANAGEMENT: E6 ROOF DAYLIGHTING

Notes

- Minimum daylight illumination levels may include a combination of daylighting sources, including rooftop skylights, rooftop tubular daylighting devices (TDDs), as well as existing windows and other wall openings.
- Minimum daylight illumination level listed in the tables must be achieved in a minimum of 75% of all regularly occupied areas directly beneath the roof area. Modeling must be based on horizontal foot candles under clear sky conditions, at noon, on the equinox, at 30 inches above the floor.
- The daylighting system must provide an overall net savings in total building energy usage, including lighting, heating and cooling requirements.
- Compliance with illumination levels and net energy savings must be verified and documented using Skycalc or a similar simulation program.
- ASHRAE 90.1, which is referenced by almost all major building codes, limits the area of roof skylights to a maximum of 5% of total roof area unless an Energy Cost Budget is developed to assure that the additional building energy loads of the skylights due to increased solar heat gain, reduced U value and increased air infiltration are offset by reduced lighting energy demand. Users of this Guideline should local energy code requirements before installing skylights accounting for more than 5% of the total roof area.
- While these minimum illumination levels currently are used in similar sustainable construction guidelines, occupants may desire higher illumination levels and this should be critically reviewed before a final daylighting design is selected.
- In order to assure overall energy efficiency, skylight curbs must be insulated to a minimum R-10 for ASHRAE Climate Zones 1-4 and R-15 for Climate Zones 5-8.

Technologies and Strategies

For many large factory and warehouse buildings without internal ceilings, the installation of roof-mounted skylights – either as part of the initial building construction or whenever the roofing system is replaced - may be one of the most economical energy-savings investments available to building owners. The economics of daylighting are especially attractive when the interior lighting system is integrated with the available daylighting with automated controls.

For building owners and roofing contractors who wish to pursue this credit, Skycalc is a free and relatively simple computer program that has been endorsed by the California Energy Commission as a suitable calculation tool for daylighting design and evaluation. The Skycalc program and training modules may be downloaded from the website of Energy Design Resources (www.energydesignresources.com).

SECTION 2: MATERIAL MANAGEMENT: M1 RECYCLED CONTENT

Intent

Increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Requirement M1A/B/C: Recycled Content

Use materials with recycled content such that the material value sum of post-consumer recycled content plus 1/2 of the pre-consumer recycled content of the roofing membrane or roofing insulation constitutes at least the following minimum percentage of the materials in the project:

MATERIAL TYPE	RECYCLED CONTENT[1]
M1A: ALL MATERIALS	≥ 10%
M1B: ROOF MEMBRANE	≥ 5%
M1C: ROOF INSULATION	≥ 5%

[1]Recycled content shall be computed using the material value sum of post-consumer recycled content plus 1/2 of the pre-consumer recycled content. The recycled content value of the roofing materials may be determined by weight as a percentage of total material weight or by current material value as a percentage of total material value. Recycled content is defined in accordance with the International Organization of Standards document, ISO 14021 Environmental Labels and Declarations, Self-Declared Environmental Claims, Type II Environmental Labeling. Post-consumer material is defined as waste material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. Pre-consumer material is defined as material diverted from the waste stream during the manufacturing process. Reutilization of materials (i.e. re-work, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it without additional processing) is excluded.

Technologies & Strategies

Existing roofing systems offer many opportunities to integrate materials with recycled content. Examples of roofing materials with recycled content include a variety of roofing membranes and roof insulations as well as metal roofing panels and components.

As roofing materials with recycled content become increasingly available, it is important that existing product material standards are not compromised. The roofing industry develops and maintains product standards to promote the durability and longevity required of materials that must perform for extended periods under a wide variety of environments and functional demands.

Roofing materials also must be designed to perform as functional components within larger roofing systems. In the same way that product material standards should not be compromised by recycled content materials, system performance standards, especially standards for fire, wind, hail and traffic resistance must also not be compromised by the introduction of recycled content materials. Any reduction or compromise in material or system performance standards should be reviewed critically before selecting roofing products with recycled materials.

SECTION 2: MATERIAL MANAGEMENT: M2 MATERIALS REUSE

Intent

Extend the lifecycle of existing building stock, conserve resources, reduce waste and reduce environmental impacts of new roofing systems as they relate to materials manufacturing and transport.

Requirement M2a: Reuse Roofing Materials

Document the reuse of a minimum of 10% of existing roofing materials as a percentage of total project material value. The origin of the reused roofing materials may include roofing installations other than the current roofing installation, providing the materials remain dry and suitable for reuse.

Special Considerations for Roof Recovers. In many roofing installations, a "recover" (the installation of a new roofing system directly over the existing roofing system) may offer an economical and sustainable roofing strategy. Whenever an existing roofing system is recovered, the existing roof insulation as well as any thermal barriers and vapor retarders may be claimed as reused materials. However, the existing roofing membrane may not be claimed since it is functionally replaced by a new roofing membrane.

Coordination with Credit D6 Construction Moisture Management. Because of the potential for latent moisture within existing roofing systems and materials, the reuse of existing materials claimed under this credit is allowed only if Credit D6 Construction Roof Moisture Management is also included as part of the roofing system application.

Technologies and Strategies

Existing roofing systems offer a number of opportunities for material reuse, providing the materials remain dry and suitable for reuse. Examples of roofing materials that may be suitable for reuse include insulation boards (especially insulation boards that have been protected by an overlying cover board), and preservative-treated nailers and blocking. The value of these existing roofing materials should be assigned based on current replacement value.

SECTION 2: MATERIAL MANAGEMENT: M3 ROOFING WASTE MANAGEMENT

Intent

Divert construction and demolition debris from disposal in landfills and incineration facilities. Redirect recyclable recovered resources back to the manufacturing process and reusable materials to appropriate sites.

Requirement M3a: Project Waste Management

Recycle and/or salvage at least 50% of nonhazardous construction and demolition debris. Develop and implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on-site or comingled. Calculations may be based on weight or volume, but must be consistently applied.

Requirement M3b: Existing Roof Membrane Recycling

Remove the roofing membrane and divert the material into a recycling program that converts at least 75% of the available membrane into the production of new roof membrane or other materials.

Requirement M3c: Existing Roof Insulation Recycling

Remove the roof insulation and divert the material into a recycling program that converts at least 75% of the available insulation into the production of new roof insulation or other materials.

Note

Requirement M3c may not be used if the roof insulation is also counted under Credit M2 Materials Reuse.

Technologies and Strategies

Establish goals for diversion from disposal in landfills and incineration facilities and adopt a construction waste management plan to achieve these goals. Roofing debris that has an open market value may be applied to the construction waste calculation. Diversion may also include donation of materials to charitable organizations and reuse of materials on-site. In addition to diversion of materials, new programs for recycling of roofing membrane and insulation are emerging that offer an opportunity to recycle diverted materials back into useful roofing products.

SECTION 2: MATERIAL MANAGEMENT: M4 LOW-VOC MATERIALS

Intent

uce the potential for low-level ozone formation by reducing the VOC content of roofing materials, especially roofing primers, sealants, adhesives, and coatings.

Requirement M4a: Reduced VOC Product Content

Use materials to install the roofing system using products with VOC content less than or equal to the following requirements:

PRODUCT	VOC CONTENT
SEALANTS	≤ 450G/L
ADHESIVES AND PRIMERS	≤ 250G/L
COATINGS	≤ 250G/L

Technologies and Strategies

This credit for roofing sealants, adhesives, primers and coatings reflects currently established rulings issued by a number of state and regional air management districts (primarily in California and the Northeast U.S.) as well as the U.S. Environmental Protection Agency (EPA 40CFR51.100(s)). Currently, a variety of roofing adhesives, primers and coatings meeting the 250 g/l criterion as well as roofing sealants meeting the 450 g/l criterion are readily available.

SECTION 3: WATER MANAGEMENT: W1 ROOF STORM WATER RETENTION

Intent

Reduce the potential for roof-related storm water runoff in order to minimize environmental impacts on rivers, lakes and other waterways.

Requirement W1a: Water Retaining Roofing System

Install one of the following water-retaining roofing system options:

INSTALL A SELF-SUSTAINING VEGETATED ROOF[1] OVER 75% OF THE ROOF SURFACE
INSTALL A NON-VEGETATED WATER-RETAINING ROOF[2] OVER 75% OF THE ROOF SURFACE.
INSTALL A HYBRID COMBINATION OF #1 AND #2 OVER 75% OF THE ROOF SURFACE AREA.

Notes

1. A self-sustaining vegetated roof requires no potable water to maintain the vegetation after an initial establishment period and under normal climatic conditions for the location of the roof. However, severe drought or other unusual local conditions may require the use of other water sources in order to maintain the long-term functionality of the roof vegetation.
2. Non-vegetated water-retaining roofing systems use a variety of water-retention mechanisms, including moisture retention mats, trays, and other retention devices to capture and hold storm water. In order to qualify as a water-retaining roof system, the roofing system manufacturer must provide documentation that the roof system design is capable of retaining at least 90% of a 1" rain event over a 24-hour period. In addition, there should be no remaining standing water after 48 hours following the rain event.

Requirement W1b: Water Retention-Ready Roofing System

Install a water retention-ready roofing system*over 75% of the roof surface.

**A water retention ready roofing system is suitable for future installation of a specific water retention technology (or technologies), as documented by the roofing system manufacture's agreement to continue the originally-issued roof warranty coverage after the installation of the water retention system(s) at a later date, subject to the terms and conditions of the roofing manufacturer's warranty*

SECTION 3: WATER MANAGEMENT: W1 ROOF STORM WATER RETENTION

Coordination with Credit D1 Durable Roof Insulation, Credit D3 Roof Traffic Protection, and Credit L1 Roof Maintenance Program. Because rooftop water retention systems may impose significant additional loads and require frequent maintenance and associated roof traffic, credits available under this section are allowed only if Credit D4 Roof Traffic Design and Credit L1 Roof Maintenance Agreement is also included as part of the roofing system application. In addition, the roof maintenance agreement must cover maintenance of the roof vegetation, planting media and related supporting elements. Credit D1 Durable Roof Insulation must also be included if the water retention system is supported directly or indirectly on the roof insulation.

Technologies & Strategies

A wide variety of roofing options are available to reduce the potential for roof-related storm water runoff. In addition, hybrid combinations of these systems may be employed to optimize storm water management and other functional project goals.

SECTION 3: WATER MANAGEMENT: W2 ROOF-RELATED WATER USE REDUCTION

Intent

Increase water efficiency by retaining and reusing roof storm water for on-site grey water use (landscaping and other non-potable uses).

Requirement W1a: Water Retaining Roofing System

Document that all roof storm water runoff is directed to a central collection and storage location for use by the building owner for landscape irrigation, decorative water features, and other non-potable uses.

Technologies and Strategies

Delivery of roof storm water may be accomplished using roof drains, gutters, downspouts and other devices that channel and direct the water to a central storage location (or locations) that may be installed and maintained by others. Documented roof drainage may be combined with a water-retaining roofing system (Credit W1), but this is not necessary..

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: D1 DURABLE ROOF INSULATION SYSTEM

Intent

Protect thermal insulation from damage in order to extend useful service life and maintain originally specified thermal resistance and energy efficiency.

Requirement D1a: Roof Coverboard

If the roofing membrane is to be applied directly over one or more layers of thermal insulation, install a roof cover board between the roofing membrane and the thermal insulation. The cover board selected shall conform to the roofing system manufacturer's recommendations for the specific roofing assembly involved.

Coordination with Credit D6 Construction Moisture Management. If the cover board selected for the roofing project is not inherently moisture-resistant (e.g. wood fiber, perlite or boards with non-moisture-resistant facers), then Credit D6 Construction Moisture Management must also be included in the project.

Technologies and Strategies

Suitable high compressive strength cover boards include code-approved high-density wood fiber, perlite, moisture-resistant gypsum board, and high-compressive foam insulation cover boards as selected and specified by the project designer and recommended by the roof system manufacturer.

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: D2 ROOF DRAINAGE DESIGN

Intent

Minimize the potential for moisture intrusion into the roofing system and the underlying building by assuring storm water is effectively drained away from the roof surface.

Requirement D2a: Documented Drainage Design

Assure consistent roof drainage through the use of a documented drainage design verified by field assessment. At a minimum, the drainage design shall include a plan drawing of the roof with callouts of elevations and slopes as well as bill of materials for all pre-fabricated tapered elements of the design. For reroofing installations, the drainage design shall also include a documented elevation survey of the roof surface using a laser level, hand level or similar surveying devices, with callouts describing how to remediate any non-draining roof areas.

Technologies and Strategies

For both new roofs and re-roofing over existing roofs, a variety of drainage systems may be used to facilitate effective drainage. Suitable materials include tapered insulation boards that can be arranged to achieve consistent drainage as well as poured fills such as lightweight concrete that can be screeded or floated to specified elevations and slopes. Roof drainage systems may be designed by many roofing professionals, including tapered roof system designers, roof consultants and roof system manufacturers.

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: D3 ROOF TRAFFIC PROTECTION

Intent

Minimize the potential for damage to the roofing system and the underlying building by assuring that the roof surface is protected from service traffic and that service traffic is limited to designated areas of the roof.

Requirement D3a: Roof Traffic Protection Plan

Implement a roof traffic protection plan to protect the roofing system from damage from activities associated with periodic service and maintenance of rooftop equipment and the roofing system and its components. Document that:

- Protective walkways have been installed to provide efficient access to all expected service locations on the roof including but not limited to HVAC units exhaust fans and other roof-mounted equipment.
- Protective walkways have been designed to minimize interference with roof drainage and have been accepted as compatible with the roofing system by the roof system manufacturer
- Permanent measures have been taken, through the placement of informational signs, personnel barriers or other methods, to discourage roof traffic in non-walkway areas.

Requirement D3b: Enhanced Roof Surface Traffic Resistance

As an alternative or in addition to a roof walkway system, install a roof system over all areas of the roof that provides enhanced surface resistance to the demands of roof traffic. Document how the roofing professional(s) associated with the project have addressed risks associated with rooftop traffic, including surface abrasion, impact, tearing and puncture. In addition, Credit D1: Durable Roof Insulation System must be included in the project as part of the enhanced roof system traffic resistance design and installation.

Technologies and Strategies

- Walkway Systems. A wide variety of roof walkway materials and systems are available, including walk pads, concrete pavers, walkway membrane rolls, and elevated walkway systems. These materials should be installed around every rooftop location requiring periodic service traffic, and these locations should be interconnected with designated roof access points.
- Enhanced Roof System Traffic Resistance. The traffic resistance of a roofing system also may be enhanced by installing roof membranes and/or combinations of membranes and other components that provide enhanced resistance to abrasion, impact, tear and puncture greater than minimum industry standards. Working as a team, the building owner, the roof system manufacturer, the roof system designer and the roofing contractor must document the criteria on which these roofing materials were selected and how these materials provide enhanced resistance to roof traffic.

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: D4 INCREASED WIND UPLIFT RESISTANCE

Intent

Minimize the potential for damage to the roofing system and the underlying building during extreme wind events by increasing the wind rating of the system beyond building code minimum values.

Requirement D4a: Enhanced Wind Uplift Design

Document that the roofing system has been designed for a design wind speed 10 mph above the 100-year wind event recurrence for the building location as determined by the International Building Code.

- Nonballasted, built-up (BUR), modified bitumen, and single-ply roofing system assemblies shall be designed in accordance with ANSI / SPRI WD-1 Wind Design Standard Practice for Roofing Assemblies.
- Ballasted roofing system assemblies shall be designed in accordance with SPRI / ANSI RP-4 Wind Design Standard for Ballasted Single-Ply Roofing.
- Roof edge assemblies shall be designed and tested in accordance with ANSI / SPRI ES-1 Wind Design Standard used with Low Slope Roofing Systems.

Technologies and Strategies

A wide variety roofing systems and roof edge systems are available that can be designed and have been tested to provide design wind uplift resistance in excess of current building code minimums.

Special Note: Air Barriers. The use of an air barrier may enhance wind resistance. However, Credit D4 may be awarded for the use of an air barrier only if the air barrier is part of a tested and rated roofing assembly providing the uplift pressure required under this credit.

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: D5 HYGROTHERMAL ANALYSIS

Intent

Minimize the potential for moisture-related degradation of the roofing system by analyzing site conditions during building construction and interior building vapor movement and installing a vapor retarder when necessary.

Requirement D5A: Hygrothermal Analysis

Subject to confirmation by a professional hygrothermal analysis of the roof system, install a roof system vapor retarder conforming to the following requirements:

- The vapor retarder may be a combined air barrier / vapor retarder, or a separate element of the roofing system.
- The vapor retarder shall have a perm rating of 1.0 or less.
- The air barrier / moisture retarder shall be continuous, with all joints and penetrations sealed or self-sealing.
- The vapor retarder shall be repairable in the event of damage or the addition of new roof penetrations.
- The vapor retarder shall be installed in accordance with the manufacturer's instructions and in such a manner as to achieve the performance requirements.

Hygrothermal Analysis. In order to determine the suitability of installing a roof system vapor retarder, a transient hygrothermal analysis of the roofing system based on external climatic and building internal moisture characteristics shall be conducted by a qualified roofing professional using WUFI-ORNL/IBP software, ORNL Moisture Control in Low-Slope Roofing on-line calculator or similar tool. In the event that the hygrothermal analysis indicates a vapor retarder is not required, the points available under this requirement will be awarded upon the submission of a copy of the analysis.

Coordination with Credit D6 Construction Moisture Management. Because it is critical to effective performance of a roof vapor retarder that construction moisture is controlled during roof system installation, the installation of a vapor retarder claimed under this credit is allowed only if Credit D6 Construction Moisture Management is also included as part of the roofing system application.

Technologies and Strategies

Movement of water vapor within roofing systems may have serious consequences. Water vapor may produce moisture condensation, leading to conditions such as mold growth and corrosion, which in turn may lead to occupant health problems and premature building deterioration.

Strategies for protection of the roofing system from moisture condensation typically require an engineering calculation of the potential for condensation within the roofing system and the installation of a vapor retarder when required. Sources

to calculate the potential for condensation include Oak Ridge National Laboratories on-line calculator for Moisture Control in Low-Slope Roofing (http://www.ornl.gov/sci/roofs+walls/articles/wetroof/wetroof.html), and the WUFI-ORNL/IBP software program, which may be downloaded at http://www.ornl.gov/sci/btc/apps/moisture/.

Information about the design and application of vapor retarders is available in the Moisture Control section of the most recent edition of the NRCA Roofing and Waterproofing Manual and the most recent edition of the *ASHRAE Handbook of Fundamentals*.

It should also be noted that there may be conditions where a vapor retarder separate from a roof air barrier should not be installed. These conditions may include very hot, moist climates where the installation of a moisture barrier may cause the roofing system to accumulate excessive moisture and prevent this moisture from migrating into the building to be extracted by the HVAC system. In a number of these cases, the roof membrane will act as the air barrier and needs to be tied-in properly to take advantage of this design factor.

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: D6 CONSTRUCTION MOISTURE MANAGEMENT

Intent

Minimize the potential for damage to the roofing system and the underlying building by assuring that the roof system is protected from moisture damage during roof system installation.

Requirement D6A: Moisture Management Plan

Document that a Moisture Management Plan has been prepared that addresses potential roof system moisture problems during the project construction phase.

At a minimum, the Moisture Management Plan shall:

- Document how materials are protected from potential moisture damage while stored and used at the project site
- Document how the roofing project is closed or "tied off" at the end of each work day to prevent moisture intrusion until the next work day.
- Document how the roof has been protected from potential moisture damage due to related construction activities that may introduce high levels of moisture beneath the roofing system (e.g. hydration of concrete floors and other concrete structures).
- For roof "recovers" involving the application of a new roofing system directly over an existing roofing system, document that the existing roof has been examined for excessive moisture using infrared, nuclear or similar scanning technology confirmed by roof test cuts and moisture testing analysis of the extracted samples. In addition, Document that areas of excessive moisture have been removed and replaced.
- Document that a construction log was maintained during the construction of the new roof recording the daily actions taken to meet the requirements of the plan with pictures showing actions taken.
- Document how damage from moisture that may accidentally enter the roofing system during construction is mitigated.

Coordination with Credit L2 Project Installation Quality Management. Because verification is an important element of any process-based control measure, this credit may only be awarded if Credit L2 Project Installation Quality Management is also awarded.

Technologies and Strategies

- Strategies for protection of roofing materials during storage and installation may be obtained from roofing materials manufacturers and roofing trade associations.
- Temporary, high-volume ventilation systems are commercially available and should be used during concrete hydration and other high moisture related construction activities. These high-volume air-handling systems include dehumidification that is essential to remove large amounts of moisture.
- Strategies for the examination of potentially harmful levels of moisture within an existing roofing system include a variety of scanning technologies that in turn may be confirmed with test cuts and laboratory analysis.

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: D7 ROOF SYSTEM DURABILITY ENHANCEMENT

Intent

Provide enhancement(s) to the durability of the roofing system not covered by other durability credits that increase system performance and extend potential service life beyond current industry standards and practices

Requirement D7a: Durability Enhancement

Add a durability enhancement to the roofing system that exceeds current industry minimum product performance standards or generally accepted design practices, increases system performance and/or extends potential roof system service life. Eligible durability enhancements shall be listed specifically in an approved Appendix to this Guideline.

Note

Material and/or design enhancements currently identified as part of other Credits in this Guideline are not eligible for inclusion under this Credit.

Technologies and Strategies

Examples of recognized durability enhancements may include but are not limited to:

- Protected membrane designs that place the primary waterproofing membrane beneath insulation or other protective material layers.
- Redundant sealing of critical membrane and flashing seams.
- Installation of additional interplies in multi-ply constructions.
- Use of sacrificial layers at areas subject to physical or chemical degradation.
- Application of surface coatings to reduce ultraviolet degradation.
- Various application techniques that reduce eccentric loads on mechanical fasteners, especially in mechanically attached membrane systems.
- Use of hail-tested systems in high hail zones.
- Increased membrane thickness for single ply membranes.
- Use of membrane with proven field performance in excess of 20 years.

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: L1 ROOF MAINTENANCE PROGRAM

Intent

Establish and maintain a long-term quality partnership to perform inspection and maintenance of the roofing system and provide the building owner with an ongoing information resource for effective inspection and maintenance of the roofing system in order to help extend roof service life.

Requirement L1a: Roof Maintenance Program

- Compile and deliver to the owner a comprehensive Roof Inspection / Maintenance Manual. The manual shall include a recommended inspection / maintenance schedule, a sample inspection / maintenance checklist, detailed descriptions of necessary routine maintenance procedures, identification of common non-conforming conditions and recommended repair procedures.
- Document the execution of a roof maintenance agreement between the building owner / agent and a professional roof maintenance provider*.

**Professional roof maintenance providers are regularly engaged in critical roof system maintenance activities, including roof system inspection, leak detection, repair and remediation. The roof maintenance provider shall be approved for conducting maintenance and repair for the project roofing system, either by the roof system manufacturer or a relevant roofing professional / trade association.*

Technologies and Strategies

Numerous research studies suggest that a formal program of ongoing roof maintenance may significantly increased roof system service life, and as a result, significantly reduce overall environmental impact. This credit encourages the building owner to establish a long-term program for roof system maintenance based on established roofing industry practices and supported by a long-term partnership with a qualified roofing maintenance professional.

SECTION 4: DURABILITY/LIFE CYCLE MANAGEMENT: L2 PROJECT INSTALLATION QUALITY MANAGEMENT

Intent

Document that the roofing project has been installed as part of an ongoing quality management program established by the roofing contractor, roof system manufacturer, roof consultant or similar roofing professional.

Requirement L2a: Quality Management Program (Self-Administered)

Document that the project was installed using a self-administered quality management program, which at a minimum shall include:

- A Company Quality Manual that identifies overall company quality principles, establishes quality standards and procedures for all roofing-related processes, and establishes a continuous improvement program to identify variations from quality standards, document actions taken to address variations on an ongoing basis.
- A Project Quality Management Plan that applies the standards and procedures of the company quality manual to establishes project-specific standards and procedures.
- A Project Quality Review Report that identifies variations from standards and procedures and documents corrective actions taken to address any variations.

Technologies and Strategies

Current quality management systems such as ISO 9000, QS 9000 or similar programs may easily be adapted to an internally managed project quality management process. External resources including roofing system manufacturer field technicians, Registered Roofing Observers (RROs) and similar professional roof quality control technicians may be used to provide additional levels of project verification.

SECTION 5: ENVIRONMENTAL INNOVATION IN ROOFING: IR1 INNOVATION IN DESIGN

Intent

Encourage and recognize significant and measurable achievement using an energy, material, water, durability or life cycle strategy not currently addressed in the Guideline.

Requirement IR1a: Design Innovation

Identify the following in writing:

- The intent of the proposed innovation credit.
- The proposed requirement for compliance.
- The proposed submittals to demonstrate compliance.
- The design approach (strategies) used to meet the requirements.

Technologies and Strategies

At the time of the development of the current version of the Guideline, a number of innovative strategies for improving the sustainability of roofing systems were identified, but were not yet adequately researched to provide suitable documentation to be established as a formal credit. Examples of these strategies may include, but are not limited to:

- Manufacture of roofing products under a Responsible Care Management System® (RCMS®) or RC14001® / ISO 14001 environmental management program.
- Product environmental impact reporting such as Environmental Product Declarations (EPDs).
- The use of rapidly renewable bio-based and regionally sourced roofing materials.
- Roof life cycle assessment programs.
- New technologies and strategies to extend service life through periodic renewal of critical roof system components.

Industry design and research professionals familiar with these and other potential innovative approaches to roof system sustainability are encouraged to explore these strategies and submit them under this credit.

SECTION 5: ENVIRONMENTAL INNOVATION IN ROOFING: IR2 EXEMPLARY PERFORMANCE

Intent

Encourage and recognize the achievement of a level of performance in energy, materials, water, durability or life cycle significantly higher than the current requirements of the Guideline.

Requirement IR2a: Exemplary Performance

Achieve exemplary performance in an existing credit in RoofPoint by significantly exceeding the current requirements of the credit. Exemplary performance may be demonstrated for achieving double the credit requirements and/or achieving the next incremental percentage threshold of an existing credit.

Technologies and Strategies

At the time of the development of the current version of RoofPoint, several innovative performance strategies for improving the sustainability of roofing systems were identified, but were not yet adequately researched to provide suitable documentation as a formal credit. Examples of these strategies may include, but are not limited to:

- Improved hail-resistance of roofing systems in hail-prone climates
- New criteria for assessing roof system sustainability, including reparability and retention of key properties over time.
- Development of a durability assessment protocol for roof systems combining historical in situ performance data, small scale testing, and predictive modeling.

Industry design and research professionals familiar with these and other potential innovative approaches to roof system sustainability are encouraged to explore these strategies and submit them under this credit.

APPENDIX A: ROOFPOINT CREDIT CHECKLIST

After reviewing the project documentation, the evaluator awards points in the column that best classifies the project for each RoofPoint credit:

- MEETS INTENT. The project fulfills the broad intent of the credit although specific conditions of the project do not support full compliance with the credit requirement.
- MEETS REQUIREMENT. The project meets the credit requirement.
- EXCEEDS REQUIREMENT. The project substantially exceeds the credit requirement and provides tangible benefit by exceeding the credit requirement.
- NO CREDIT. The project does not meet either the intent or the requirement of the credit.

One point is awarded for each credit for each "Meets Intent" and "Meets Requirement" achieved, and one and one-half points are awarded for each "Exceeds Requirement" achieved.

For inclusion in the RoofPoint program, a minimum of 12 total points must be achieved, with a minimum of 3 points in energy management, 2 points in materials / water management, and a minimum of 4 points in durability / life cycle management.

SECTION 1: ENERGY MANAGEMENT

NO.	CREDIT/REQUIREMENT	MEETS INTENT	MEETS RQMT	EXCEEDS RQMT	NO CREDIT
E1	HIGH R ROOF				
	E1a: High R Value				
E2	BEST THERMAL PRACTICES				
	E2a: Multiple Layer Insulation				
	E2b: Reduce Thermal Discontinuities				
E3	ROOF SURFACE THERMAL CONTRIBUTION				
	E3a: Optimize Net Energy Efficiency				
	E3b: Optimize Peak Energy Efficiency				
	E3c: Reduce Heat Island Effect				
E4	ROOF AIR BARRIER				
	E4a: Roof Air Barrier				
E5	ROOFTOP ENERGY SYSTEMS				
	E5a: Rooftop Energy System				
	E5b: Energy-Ready Roof				
E6	ROOF DAYLIGHTING				
	E6a: Non-Controlled Daylighting				
	E6b: Controlled Daylighting				
TOTAL ENERGY MANAGEMENT					

APPENDIX A: ROOFPOINT CREDIT CHECKLIST

Section 2: Materials Management

NO.	CREDIT/REQUIREMENT	MEETS INTENT	MEETS RQMT	EXCEEDS RQMT	NO CREDIT
M1	RECYCLED CONTENT				
	M1a: All Roofing Materials				
	M1b: Roofing Membrane				
	M1c: Roof Insulation				
M2	MATERIAL REUSE				
	M2a: Reuse Roofing Materials				
M3	ROOFING WASTE MANAGEMENT				
	M3a: Project Waste Management				
	M3b: Existing Membrane Recycling				
	M3c: Existing Insulation Recycling				
M4	LOW VOC MATERIALS				
	M4a: Low VOC Products				
TOTAL MATERIAL MANAGEMENT					

Section 3: Water Management

NO.	CREDIT/REQUIREMENT	MEETS INTENT	MEETS RQMT	EXCEEDS RQMT	NO CREDIT
W1	ROOF STORM WATER RETENTION				
	W1a: Water Retaining System				
	W1b: Water Retaining-Ready System				
W2	ROOF-RELATED WATER USE REDUCTION				
	W2a: Collect Roof Water Runoff				
TOTAL WATER MANAGEMENT					

APPENDIX A: ROOFPOINT CREDIT CHECKLIST

Section 4: Durability/Life Cycle Management

NO.	CREDIT/REQUIREMENT	MEETS INTENT	MEETS RQMT	EXCEEDS RQMT	NO CREDIT
D1	DURABLE ROOF INSULATION SYSTEM				
	D1a: Roof Coverboard				
D2	ROOF DRAINAGE DESIGN				
	D2a: Documented Drainage Design				
D3	ROOF TRAFFIC PROTECTION				
	D3a: Traffic Protection Plan				
	D3b: Durable Roof Surface				
D4	INCREASED WIND UPLIFT RESISTANCE				
	D4a: Enhanced Wind Uplift Design				
D5	HYGROTHERMAL ANALYSIS				
	D5a: Hygrothermal Analysis				
D6	CONSTRUCTION MOISTURE MANAGEMENT				
	D6a: Moisture Management Plan				
D7	ROOF SYSTEM DURABILITY ENHANCEMENT				
	D7a: Durability Enhancement				
L1	ROOF MAINTENANCE PROGRAM				
	L1a: Maintenance Program				
L2	PROJECT INSTALLATION QUALITY MANAGEMENT				
	L2a: QM Program (Self-Admin.)				
TOTAL DURABILITY/LIFE CYCLE MGMT					

APPENDIX A: ROOFPOINT CREDIT CHECKLIST

Section 5: Innovation in Roofing

NO.	CREDIT/REQUIREMENT	MEETS INTENT	MEETS RQMT	EXCEEDS RQMT	NO CREDIT
IR1	INNOVATION IN DESIGN				
	IR1a: Design Innovation				
IR2	EXEMPLARY PERFORMANCE				
	IR2a: Exemplary Performance				
TOTAL INNOVATION IN ROOFING					

Project Grand Total

NO.	CREDIT/REQUIREMENT	MEETS INTENT	MEETS RQMT	EXCEEDS RQMT	NO CREDIT
TOTAL INNOVATION IN ROOFING					

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