LEED 2009 NC PROGRAM

The LEED Green Building Rating System is a system developed to certify "green" buildings under a system created and promulgated by the U.S. Green Building Council. LEED stands for "**L**eadership in **E**nergy and **E**nvironmental **D**esign". The current version of this program is LEED 2009 NC, for New Construction. Architects attempt to certify their buildings for a variety of reasons, including state and local government incentives in some areas, Federal government requirements on some projects, professional recognition and because they want to be environmentally responsible.

The rating system gives points for a project in the following categories: **SS** sustainable sites (26 possible points), **WE** water efficiency (10 possible points), **EA** energy and atmosphere (35 possible points), **MR** materials & resources (14 possible points), **EQ** indoor environmental quality (15 possible points), **ID** innovation & design process (6 possible points), and **RP** regional priority (4 possible points). The total possible points are 69. To become certified takes 40 to 49 points. 50 to 59 points gets the building Silver Certification. 60 to 79 points achieves Gold Certification and 80 to 110 points obtains Platinum Certification. There are also several items that are minimum requirements for any certification level and do not earn any points. These items are erosion and sediment control, fundamental building systems commissioning, minimum energy performance, CFC reduction in HVAC&R equipment, storage & collection of recyclables, minimum indoor air quality performance, and environmental tobacco smoking control. The LEED program certifies buildings only; not individual construction products so Fabral can not seek LEED certification of any of our products.

Let's get to specifics of how an Architect can gain LEED points by using Fabral's products! The first possible point is under sustainable sites. One point can be obtained under credit **SS 7.**1 for covering 50% of the hard scape (parking lots, sidewalks, etc.) with a product, such as metal roofing, that has a Solar Reflectance Index (SRI) of 29 or higher. One point can be earned under credit **SS 7.2** by using a roof system that is highly reflective AND has a high emissivity as rated by a new method called the Solar Reflectance Index (SRI). This requirement is intended to reduce the heat island effect. LEED no longer uses the Energy Star program requirements. One nice change is that the SRI is calculated from the initial reflectivity and the initial emissivity. This means that, unlike Energy Star approval, we no longer have to wait 3 years for aged reflectivity values for the LEED program. For a low slope roof of 2:12 or less, the SRI must be at least 78. For a steep slope roof of over 2:12 pitch the SRI must be at least 29. We have many colors that meet the steep slope requirements and a few that meet the stiffer low slope requirements. The SRI values for our standard colors and some special colors are listed on the tables at the end of this technical bulletin. A reflective metal roof can also help toward the energy efficiency prerequisite and the optimized energy performance requirements in credit **EA 1** which is up to 19 credits under energy & atmosphere section. This section compares the reduced design energy cost for the project compared to the energy cost budget according to ASHRAE Standard 90.1. The greater the energy savings, the more the points; up to 19 points for a 48% reduction in energy requirements over the ASHRAE energy budget. ASHRAE is the **A**merican **S**ociety of **H**eating, **R**efrigerating and **A**ir-Conditioning **E**ngineers, Inc. Highly reflective metal roofing helps reduce the air-conditioning costs and helps to meet this requirement, but it's only a small part of the equation. Under credit **EA 2**, between 1 and 7 points are available for developing on-site renewable energy. This can be accomplished using Fabral's Solar SSR system. **EA 2** allows 1 point for generating 1% of the

building's energy requirements on-site with solar panels. **EA 2** allows various points up to 7 points for generating 13% of the building's energy requirements on-site with solar panels.

Under materials & resources 1 point can be earned under credit **MR 2** by recycling or salvaging at least 50% of the construction, demolition and land clearing waste. Naturally, 100% of any scrap metal roofing and siding panels or drop from cutting can be recycled. This 50% number, like all of the LEED points, is based on the entire construction project, so recycling 100% of the metal roofing and siding panel scrap may not offset the scrap from other construction products that are not salvageable. As with most of these averaged points, the higher than required values from metal panels help to offset other "less green" products. An additional point can be earned under credit **MR 2** by recycling or salvaging at least 75% of the construction, demolition and land clearance waste. Under credit **MR 4** one point is awarded if the weighted average recycled content of the building products are at least 10% and an additional point is awarded under credit **MR 4** if the weighted average recycled content of the building products are at least 20%. The recycled content is defined as the post-consumer recycled content plus half the pre-consumer content. (Pre-consumer was formerly called post-industrial recycled content.)

Per our Technical Bulletin 725:

	Post-Consumer	Pre-Consumer (post industrial)	Total per LEED MR4 post-consumer + ½ pre-consumer
Steel	19.8%	14.4%	27.0%
Aluminum	60%	25%	72.5%
Copper	50%	25%	62.5%

As you can see, the more metal roofing and siding they use on a project the better chance that have to offset the poor, less fortunate other construction products with little or no recycled content and the better the chance they'll get the 2 points, or at least 1 point from this credit. Credit **MR 5** allows 1 or 2credits if a weighted average of 10% or 20% of the building material is **manufactured and harvested** regionally, within 500 miles of the jobsite. Since the materials we use are extracted from all over the world and very difficult to trace back from a specific project to the extraction point. As a result, metal panels typically do not contribute to this point.

Let's not forget the Innovation and design credits that should be available by incorporating Fabral's Phase Change Material into a building project.

We do get questions about the VOC levels in our panels. The VOC section is intended for field applied paint applied to the interior of the building only. As a result, our panels have no contribution to the VOC levels in the building.

ARCHITECTURAL KYNAR COLORS
8/05/13

COLOR	Color Number	Initial Total Solar Reflectivity (color family)*	3 Yr. Exposed Solar Reflectivity (color family)*	Initial Emissivity (color family)*	Energy Star Approved	Initial Total Solar Reflectivity (actual)	Initial Emissivity (actual)	SRI	Meets LEED Requirement
ALMOND	S23	0.61	0.55	0.87	YES	0.63	0.86	75	STEEP
BONE WHITE	S03	0.71	0.67	0.84	YES	0.72	0.84	87	LOW & STEEP
BRANDYWINE	S24	0.25	0.23	0.85	YES	0.26	0.85	24	
BRIGHT COPPER	S25	0.45	0.35	0.77	YES	0.49	0.85	55	STEEP
BRIGHT SILVER	S66	0.57	0.35	0.77	YES	0.60	0.77	68	STEEP
CLASSIC GREEN	S02	0.26	0.25	0.83	YES	0.26	0.84	24	
CHAMPAGNE	S20	0.37	0.35	0.75	YES	0.37	0.83	38	STEEP
CHARCOAL GRAY	S01	0.27	0.25	0.85	YES	0.32	0.85	32	STEEP
COLONIAL RED	S10	0.25	0.23	0.83	YES	0.34	0.86	35	STEEP
DARK BRONZE	S04	0.25	0.25	0.83	YES	0.26	0.84	24	
HARTFORD	S05	0.27	0.25	0.83	YES	0.10	0.82	2	
MANSARD	S07	0.26	0.25	0.85	YES	0.29	0.86	29	STEEP
MATTE BLACK	S08	0.27	0.25	0.83	YES	0.27	0.86	26	
MEDIUM BRONZE	S09	0.26	0.25	0.85	YES	0.30	0.87	31	STEEP
PATINA GREEN	S14	0.26	0.27	0.89	YES	0.29	0.87	29	STEEP
PEWTER	S11	0.36	0.35	0.77	YES	0.36	0.85	38	STEEP
REGAL BLUE	S12	0.26	0.25	0.85	YES	0.28	0.86	27	STEEP
REGAL WHITE	S38	0.68	0.65	0.86	YES	0.68	0.86	82	LOW & STEEP
SANDSTONE	S17	0.50	0.35	0.85	YES	0.54	0.86	63	STEEP
SIERRA TAN	S70	0.31	0.31	0.87	YES	0.38	0.86	41	STEEP
SILVERSMITH	S15	0.53	0.35	0.77	YES	0.53	0.80	59	STEEP
SLATE BLUE	S13	0.26	0.25	0.85	YES	0.26	0.85	24	
SLATE GRAY	S19	0.37	0.35	0.85	YES	0.37	0.86	39	STEEP
STONE GRAY	S18	0.36	0.35	0.84	YES	0.36	0.84	37	STEEP
SURREY BEIGE	S21	0.40	0.41	0.90	YES	0.40	0.86	43	STEEP
GALVALUME UNPAINTED		0.78	0.58	0.06	YES	0.78	0.06	75	STEEP
GALVALUME / CLEAR COATED		0.68	0.55	0.14	YES	0.68	0.14	58	STEEP

Note: Reflectivity tested by ASTM C1549 and Emissivity measured by ASTM C1371.
* Indicates color family values, which are used by the Energy Star program. LEED uses actual values.
Note: LEED requirements are an SRI of 29 or higher for steep slope and an SRI of 78 or higher for low slope. CRRC approved colors were not submitted for Energy Star approval.

ENDURACOTE
COLORS
8/05/13

COLOR	Color Number	Initial Total Solar Reflectivity (color family)*	3 Yr. Exposed Solar Reflectivity (color family)*	Initial Emissivity (color family)*	Energy Star Approved	Initial Total Solar Reflectivity (actual)	Initial Emissivity (actual)	SRI	Meets LEED Requirement
BRIGHT WHITE	824	0.53	0.63	0.85	YES	0.60	0.85	71	STEEP
EVERGREEN	875	0.27	0.25	0.85	YES	0.27	0.86	26	NO
CHARCOAL	851	0.27	0.25	0.85	YES	0.35	0.86	37	STEEP
CLASSIC BURGUNDY	853	0.25	0.22	0.86	YES	0.26	0.86	25	NO
TAN	855	0.44	0.41	0.84	YES	0.38	0.90	42	STEEP
COCOA BROWN	856	0.26	0.22	0.85	YES	0.35	0.85	36	STEEP
DARK BROWN	859	0.26	0.22	0.86	YES	0.30	0.86	30	STEEP
HICKORY MOSS	870	0.38	0.37	0.87	YES	0.36	0.89	39	STEEP
TRUE BLACK	882	0.30	0.24	0.85	YES	0.30	0.85	30	STEEP
IVORY	883	0.61	0.63	0.86	YES	0.62	0.89	75	STEEP
CARIBBEAN BLUE	881	0.26	0.29	0.85	YES	0.27	0.90	28	NO
LIGHTSTONE	887	0.52	0.51	0.86	YES	0.51	0.90	60	STEEP
LIGHT GRAY	889	0.31	0.31	0.87	YES	0.31	0.87	32	STEEP
PATINA GREEN	893	0.36	0.36	0.84	YES	0.38	0.90	42	STEEP
BRICK RED	898	0.32	0.33	0.86	YES	0.31	0.90	33	STEEP
WHITE	899	0.62	0.53	0.86	YES	0.54	0.89	64	STEEP
BRIGHT RED	845	0.25	0.22	0.86	YES	0.32	0.86	33	STEEP
ANTIQUE BRONZE	854	0.26	0.22	0.83	YES	0.29	0.83	27	NO
GALLERY BLUE	826	0.25	0.25	0.86	YES	0.29	0.86	29	STEEP
HARTFORD GREEN	821	0.29	0.22	0.85	YES	0.29	0.85	28	NO
BRIGHT COPPER PENNY	939	0.48	0.35	0.77	YES	0.48	0.83	53	STEEP
SIERRA BROWN	896	0.25	0.25	0.85	YES	0.25	0.85	23	NO
POLAR WHITE	860	0.55	0.63	0.83	YES	0.63	0.89	76	STEEP
GALVALUME		0.78	0.58	0.06	YES	0.40	0.86	75*	STEEP
GALVALUME/ CLEAR		0.68	0.55	0.14	YES	0.61	0.85	58*	STEEP

Note: Reflectivity tested by ASTM C1549 and Emissivity measured by ASTM C1371.
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