Funded by the European Union

Mitigation Enabling Energy Transition in the MEDiterranean region

ECO - CONSTRUCTION – E2

Prepared by Sabine SAAD, ALMEE

Presented by Adel MOURTADA, ALMEE

Training on GRASSMED – meetMED II

WP3_A3.1.6

Date

OUTLINE

- ✓ What is Eco-Construction?
- ✓ Why caring about Eco-friendly Construction?
- ✓ Characteristics of Eco-Construction Materials
- ✓ The Benefits of Eco-Construction Materials
- ✓ How do you know if the Material you are considering is Environmentally Friendly or Not
- ✓ Selection of some Eco-Construction Materials
  - Metals
  - Polymers - Easy to handle pallets for rooftop greening
  - Natural Materials
  - Building Insulation (Thermal and/or acoustic)
  - Ceramics and Glass
  - Composites
  - Ceilings and Walls
  - Walls and Floors
  - Modern Eco-Friendly Furniture
- ✓ Objectives
- ✓ How to comply with GRASSMED?

What is Eco-Construction?

- **The word "eco" is a term that gets tossed around a lot these days. The eco-construction industry has been growing in leaps and bounds, with more and more people opting for an environmentally friendly way to construct their homes or businesses.**

This term is often used to describe buildings that are constructed sustainably. It describes a product that has been designed to do the least possible damage to the environment. The materials used in eco-friendly construction are sustainable and environmentally friendly from start to finish, creating a healthier space for your family as well. Construction materials are one of the most important contributors to green construction and sustainable architecture, as they comprise a large proportion of the building. In addition, Eco-construction may incorporate recycled or reclaimed materials like wood, glass, metal, and concrete in the design phase.

Why caring about Eco-friendly Construction?

It is better for the environment. This includes being a good citizen and helping to protect what we have from now on instead of waiting until it's too late, such as saving our forests or repairing the ozone layer that protects us from ultraviolet radiation.

It can save money by using materials that are recyclable and don't need to be replaced that often.

It is healthier for the occupants. They are exposed to less toxic materials when working near construction sites or living in a new building if built with eco-friendly elements in mind, which means no more worries about breathing in harmful substances or getting sick from being too close to a building site;

It can save time using the right eco-friendly mixtures. Eco-construction materials are designed to be more efficient, and they save time since these elements lack the need for patching or repairing.

Characteristics of Eco-Construction Materials

Eco-construction materials are characterized as follows:

- Biodegradable matter - It is generally organic material such as plant and animal matter and other substances originating from living organisms, or artificial materials that are similar enough to plant and animal matter to be put to use by microorganisms.
- Originate from renewable resources
- Can be reused and/or recycled
- Locally available
- Have little embodied energy
- Its waste product can be reused
- Durable with long life span
- Reduce air, land, and water pollution
- Aids energy efficiency in building

How do you know if the Material you are considering is Environmentally Friendly or Not?

It is a great idea to be aware of the materials used for construction and their environmental impact. The more we know about them, the better decision we will make on which material is best and environmentally friendly.

Eco-Friendly – Having little or no adverse effect on wildlife or humans because natural resources have been protected from damage. There are many ways to assess whether there might be some harmful effects when using certain products, but we'll focus here on some of the most important ones:

How do you know if the Material you are considering is Environmentally Friendly or Not?

- **A material's chemical composition - If it contains any known carcinogens that are not environmentally friendly at all;**
- **Its toxicity for humans and animals – substances like asbestos or arsenic will be harmful when in contact with skin or inhaled into the air we breathe while working on this construction site.**
- **The level of hazardous waste produced by using this product during the manufacturing process. Some materials will cause more pollution as they are being created than others because they require chemicals such as hydrochloride acid, sulfuric acid, etc..**

When selecting any material, we should understand:

- The final purpose of using this material
- The need for the building or space
- The technical specifications
- Find with our clients if they have any type of health concerns or any type of expectations (ex: family long term stay-health issues…)
- Know the budget
- Find if there are safe materials within that budget
- High health concerns

Selection of some Eco-Construction Materials

Metals

Some types of eco-friendly metals are listed below:

- The New S-TEN1, a steel material, saw the level of corrosion rise
- HTUFF (Super High HAZ (Heat-affected zone) Toughness Technology)
- NFG®, Ultrafine grained steel sheets
- Chromium-free Coated Steel Sheet
- High-endothermic steel sheet

Selection of some Eco-Construction Materials

Polymers

- Easy to handle pallets for rooftop greening
- UL recognized tubing as replacement for PVC tubing
- S-Lec Solar Control Film / S-Lec Sound & Solar Film

Selection of some Eco-Construction Materials

Natural Materials

- BREVANO ECO: Anti-flaming, antistatic fabric with ecology-specs
- Coffee Husk (combined with recycled plastics)

Selection of some Eco-Construction Materials

Building Insulation (Thermal and/or acoustic)

- Freon-gas-free sophisticated phenolic foam insulation
- "Foam lite Eco" HFC free spray applied polyurethane foam (highly resistant to moisture and heat)
- “Thermo-break”: physically cross-linked closed cell polyolefin foam, factory fused to a reinforced 9µm aluminum foil and backed with a specially developed acrylic tissue interlayer adhesive system
- Fiberglass with improved R-values
- Cork
- Mycellium

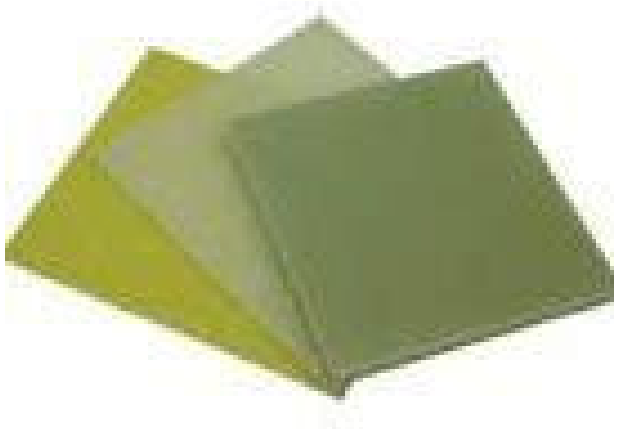
Selection of some Eco-Construction Materials

Ceramics and Glass

- ST-coat containing the photo-catalytic titanium dioxide
- Crystal Clay CLB-series: ceramic quality blocks
- Crystal Clay FT-series: stoneware quality tiles
- Substitution of aggregate made from coal ash for natural aggregate
- Storm windows and Storm Doors

Selection of some Eco-Construction Materials

Composites



- New timber made from architectural waste of woods
- Halogen-free Glass Epoxy Multi-Layer Materials

Selection of some Eco-Construction Materials

Ceilings and Walls

- Armstrong High light reflectance acoustical ceilings or equivalent
- Magnesia core: for all your indoor and outdoor construction
- Bamboo wall Ceilings
- Cob

Selection of some Eco-Construction Materials

Walls and Floors

- Bamboo
- Marmoleum
- Recycled Metal Tiles
- Recycled Plastic blocks (sidewalks)
- Greenflo Flooring System - Recycled Wood Flooring System

Selection of some Eco-Construction Materials

Modern Eco-Friendly Furniture

- **Inmod: Bamboo wood furniture including tables, desks, seating, children furniture, lighting… etc**
- **Newspaper wood**

Objectives

The intent of this measure is to choose eco-construction materials to reduce environmental and economic impacts associated with excessive energy use and improve quality of the building's envelope.

Earned Credit:

E2-1: Material Category - The credit will be earned if at least 30% installation of these materials (listed above) is applied in the building design.

E2-2: Eco-Friendly Insulation Percentage - based on the percentage of insulation of these materials applied in the building design.

E2-3: Mandatory Insulation (100%) for Hot Water Pipes, Refrigerants' Pipes, and Ducts.

How To Comply With GRASSMED?

- Any material that is included in the list above and is also mentioned in the building's materials' list will receive a scoring point based on the scoring criteria evaluated in the table below.
- Note that any material that complies with the eco-friendly characteristics and not mentioned in the list above will also receive a scoring point on one condition that a certificate approving technical properties of the material must be submitted to the assessor.
- The percentage % of insulation of these materials applied in the building design reflects the percentage of eco-friendly insulation with respect to total installed insulation.
- Insulated structure includes wall, ceiling, and floor slabs.
- The case of 100% insulation of some building materials is considered and scored.

How To Comply With GRASSMED?

The maximum scoring points for Eco-Construction Materials, the requirements for both commercial and residential buildings are given in the table below:

Compliance with Requirements	Scoring Points
Maximum Scoring for Residential and Commercial Buildings	26
Metals	
20% - 40%	1
40.1%-60%	2
≥ 60.1%	3
Plastics	
20% - 40%	1
40.1%-60%	2
≥ 60.1%	3
Ceramics and Glass	
20% - 40%	1
40.1%-60%	2
≥ 60.1%	3
Ceilings	
20% - 40%	1
40.1%-60%	2
≥ 60.1%	3

How To Comply With GRASSMED?

Walls	
20% - 40%	1
40.1%-60%	2
≥ 60.1%	3
Floors	
20% - 40%	1
40.1%-60%	2
≥ 60.1%	3
Percentage % insulation of these materials	
10% - 20%	2
20.1% - 30%	3
30.1%-40%	4
≥ 40.1%	5
100% insulation of these materials	
Hot Water Pipes	1
Refrigerants' Pipes	1
Ducts	1

TOOLS

GRASS Tool

Envelope

Thermal Performance of Building Envelope

Eco-Construction

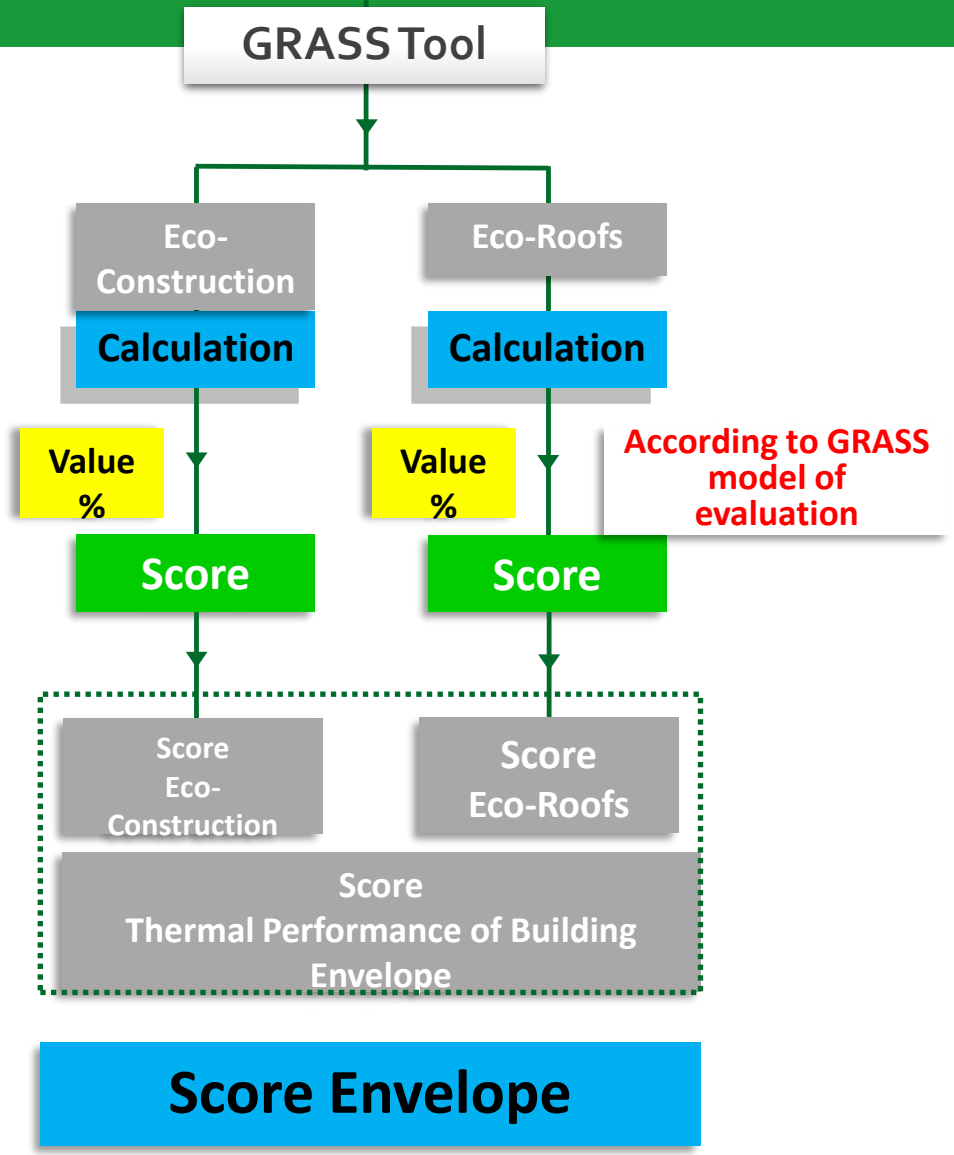
% of Eco-Material Installation

% of Insulation using ECM

Eco-Roofs

% Vegetated Exposed Roofs

Energy Efficiency Levels



Contact us!

meetMED
Mitigation Enabling Energy Transition in the MEDiterranean region
Together We Switch to Clean Energy

For any inquires or comments,
please don't hesitate to contact us

www.meetmed.org
meetMED Project
@meetmed1

www.almeelebanon.com
almeelb
AlmeeLB
AlmeeLB
almeelb

This project is funded by the European Union