

Mapping of

ATENA metal ceilings and
products for dry construction
systems

according to LEED®
certification

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Context

Atena aims at promoting the use of metal ceilings in each setting, realizing long lasting and safe systems, easy to install and which can fit all needs. Atena's solutions are produced with high quality materials adopting a great variety of decorative finishing.

Atena S.p.A. works both for the Civil and the Naval field, offering both standard and custom-made solutions or custom made systems, to satisfy all needs and be in line with the contemporary architectural trends.

Production operations take place in Gruaro (VE).

ATENA commissioned Life Cycle Engineering (LCE) the mapping of the products within the framework of LEED certification criteria. The document is structured as follows:

1. Presentation of **LEED certification**
2. Presentation of **ATENA products** under the scope of this mapping
3. **LEED credits** where ATENA products can concur for point achievement

1	LEED CERTIFICATION
2	ATENA PRODUCTS
3	LEED CREDITS - BDC protocol
3	LEED CREDITS - EBOM protocol

LEED® certification – Overview

The Leadership in Energy and Environmental Design (LEED®) certification was developed by the U.S. Green Building Council (USGBC) and aims at rating buildings, taking into account different aspects, from the design to the demolition phase. This certification is issued to the building, and not to the specific product. However, products can contribute towards certification achievement if they meet LEED requirements.*

The LEED® certification is composed of different protocols, which analyse different building typologies or aspects of the same construction. These documents have currently reached the 4th version. The selected protocols for the purpose of ATENA product mapping are:

- 1. Building design and construction (BDC)**
- 2. Building operations and maintenance (EBOM)**

*Further details are available at the following links:

- <https://new.usgbc.org/leed>
- <https://www.youtube.com/watch?v=tIVseOWToL4>

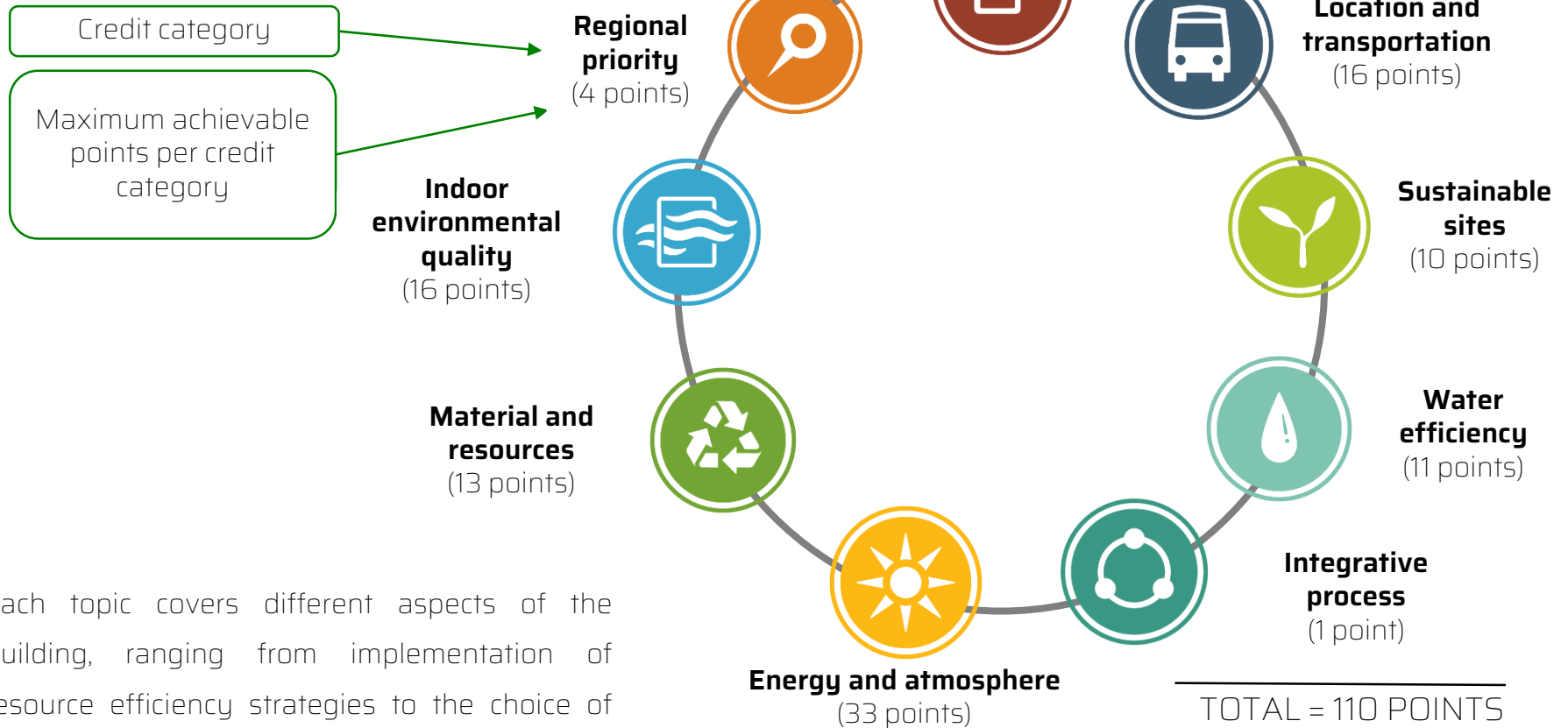
LEED® certification – Building categories in the BDC and EBOM protocols

The LEED® protocols **Building design and construction** (BDC) and **Building operations and maintenance** (EBOM) addresses the following building categories:

- 1. New Construction and Major Renovation:** addresses design and construction activities for both new buildings and major renovations of existing buildings.
- 2. Existing buildings:** designed to certify the performance of already existing buildings
- 3. Core and Shell:** destined to projects where the developer controls the design and construction of the entire mechanical, electrical, plumbing, and fire protection system.
- 4. Schools:** designed for buildings with learning spaces and can be used for higher education and non-academic buildings on school campuses.
- 5. Retail:** addresses buildings like banks, restaurants, apparel, electronics and everything in between.
- 6. Data Centers:** designed to meet the needs of high density computing equipment such as server racks, used for data storage and processing.
- 7. Warehouses and Distribution Centers:** for buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings.
- 8. Hospitality:** designed for hotels, motels, inns, or other businesses within the service industry that provide transitional or short-term lodging with or without food.
- 9. Healthcare:** designed for hospitals that operate 24/7 and which give both acute and long-term treatment.

LEED® certification – How it works: BDC

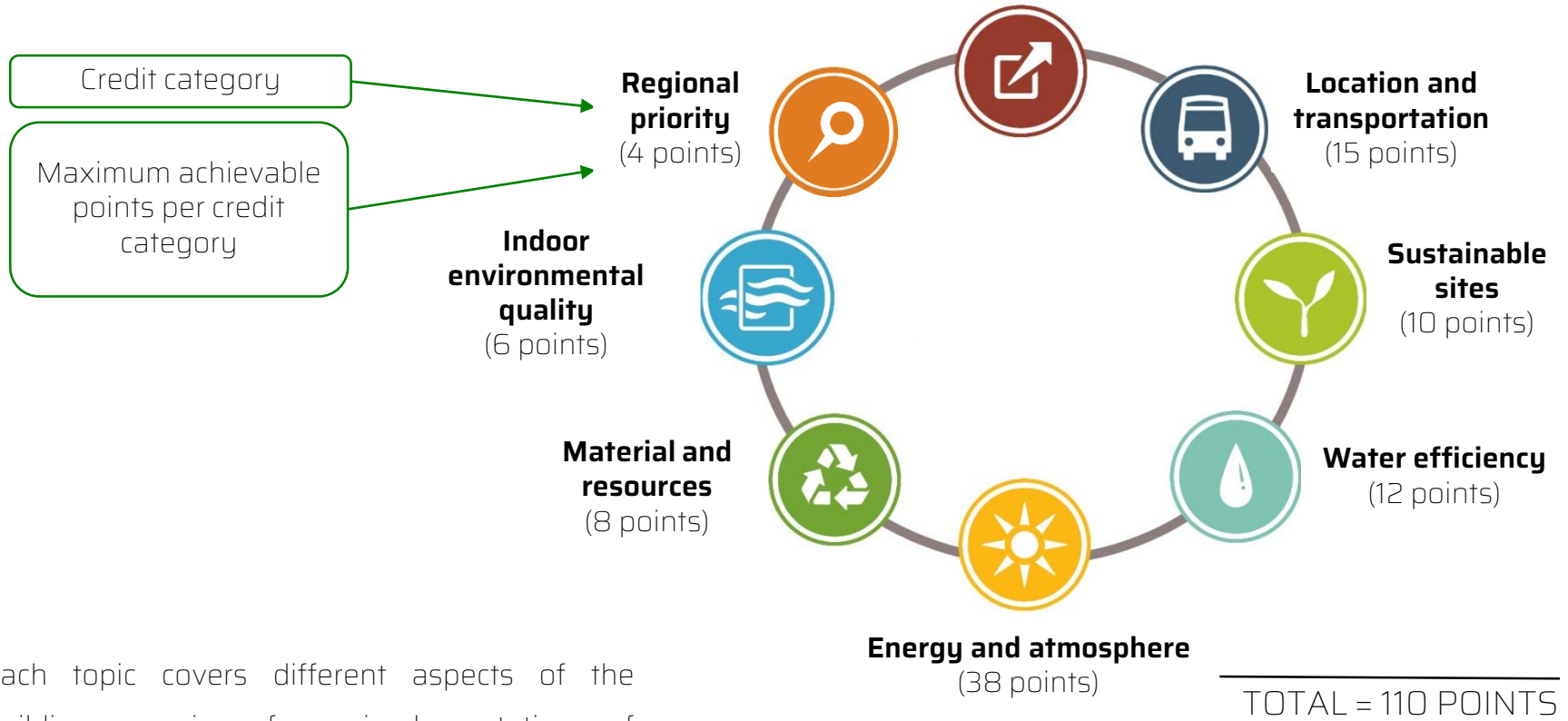
The protocol **BDC** addresses nine topics:



Each topic covers different aspects of the building, ranging from implementation of resource efficiency strategies to the choice of responsible sourcing and harvesting of materials.

LEED® certification – How it works: EBOM

The protocol **EBOM** addresses eight topics:



Each topic covers different aspects of the building, ranging from implementation of resource efficiency strategies to the choice of responsible sourcing and harvesting of materials.

LEED® certification - How it works

Each credit category is composed of credits which provide points to the construction project. Below, credits for the category “Material & Resources” are shown as an example, together with the maximum achievable points per credit:

Credit category	0	0	0	Materials and Resources	13
	Y			Prereq Storage and Collection of Recyclables	Required
	Y			Prereq Construction and Demolition Waste Management Planning	Required
Credit name				Credit Building Life-Cycle Impact Reduction	5
				Credit Building Product Disclosure and Optimization - Environmental Product Declarations	2
				Credit Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
				Credit Building Product Disclosure and Optimization - Material Ingredients	2
				Credit Construction and Demolition Waste Management	2

In some cases, each credit can be furtherly subdivided in one or more options which provide a specific amount of points. Depending on the amount of points gathered across all available credit categories during the certification phase, the project receives a rating as follows:



Certified
(40 - 49 points)



Silver
(50 - 59 points)



Gold
(60 - 79 points)



Platinum
(80 points or more)

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ATENA products

ATENA produces different items for metal ceilings and dry construction systems. Moreover, ceilings usually come with a coloured surface finishing depending on the application.

The main products* under the scope of this study are:

1. T-grids
2. Metal tiles ceilings
3. Metal staves ceilings
4. Metal baffle ceilings
5. Metal mesh ceilings
6. Open Cells ceilings
7. Special shapes ceilings
8. Floating island ceilings
9. Healthcare ceilings
10. Partition wall systems
11. Channels and profiles for dry construction systems

The above products represent the 95% of ATENA 2018 production. The main constituent materials are reported on the right.



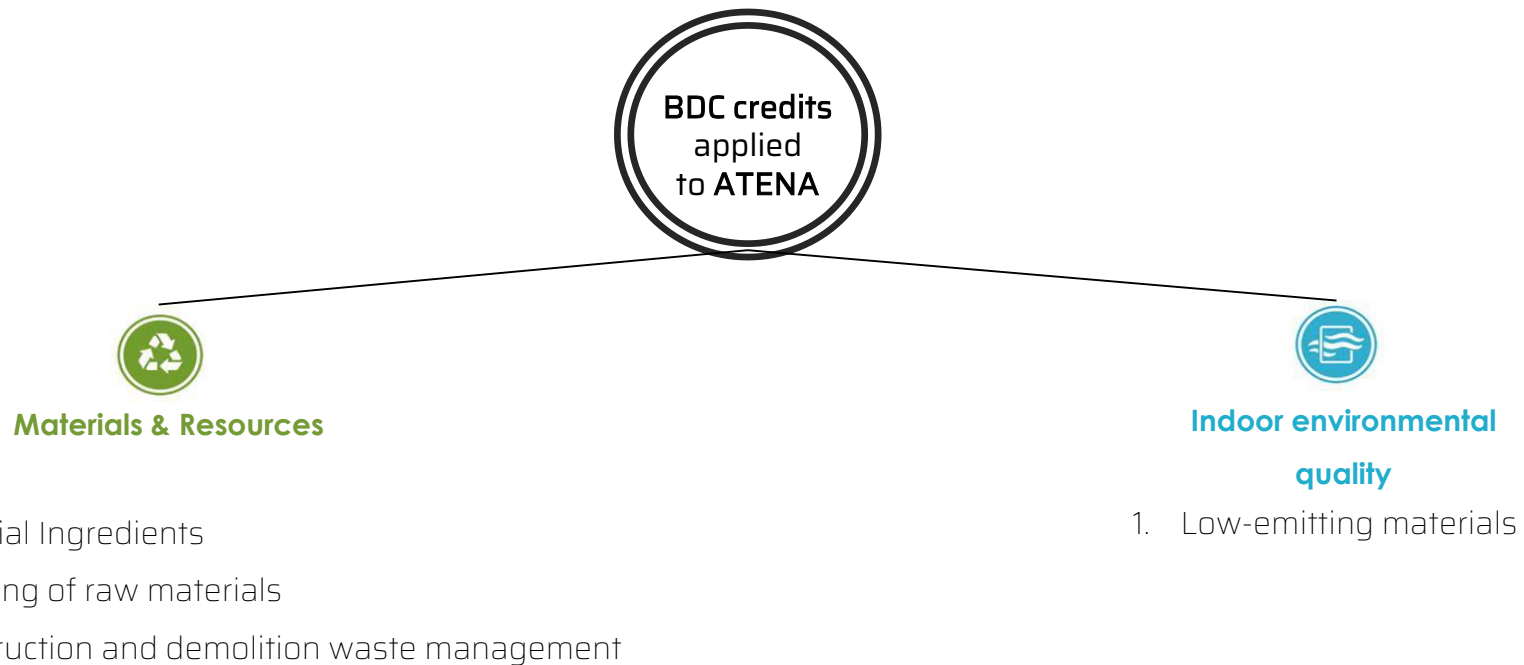
*The ceiling system ranges above mentioned include all components i.e. the visible surfaces the bearing structures, the suspensions, the wall angles and all other accessories such as clips, brackets, joints, anti seismic kits and so on.

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LEED® credits – Overview of BDC credits applicable to ATENA

The mapping of ATENA products according to BDC protocol requirements provided the credits to which ATENA products can contribute. An overview is shown in the scheme below.

Please note that, since ATENA products under analysis have the same composition and application, credits are valid across all product typologies, unless otherwise specified.



LEED® credits – Material and Resources

The Materials and Resources credit category focuses on:

- Materials with verified environmental life-cycle impacts;
- Materials that promote resource efficiency;
- Materials which have been extracted or sourced in a responsible way both considering environment and human health safety.

Credits and points for the category **Material Resources** are shown in the image below.

0	0	0	Materials and Resources	13
Y			Prereq Storage and Collection of Recyclables	Required
Y			Prereq Construction and Demolition Waste Management Planning	Required
			Credit Building Life-Cycle Impact Reduction	5
			Credit Building Product Disclosure and Optimization - Environmental Product Declarations	2
			Credit Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
			Credit Building Product Disclosure and Optimization - Material Ingredients	2
			Credit Construction and Demolition Waste Management	2

ATENA products can contribute to point achievement in the credits:

- **Building product disclosure and optimization – material ingredients**
- **Building product disclosure and optimization – sourcing of raw materials**
- **Construction and demolition waste management**

LEED® credits - Material resources: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION - MATERIAL INGREDIENTS

In category “**Material Resources**”, the credit “**Material Ingredients – Option 2: material ingredient optimization (1 point)**” aims at rewarding construction projects which select products for which the chemical ingredients are inventoried using an accepted methodology.

LEED requirement

LEED recognizes REACH as a way to assess the presence of SVCH (substances of very high concern) in the product, requiring that no such substance is reported in the list.

ATENA contribution

ATENA can contribute to such credit since false ceilings and related elements are produced without using any of the SVHC reported in the REACH list.

Documentation required

Provide a bill of materials which reports that the raw materials used for ATENA's products do not include substances listed in the document "Candidate List of SVHC" released by European Chemicals Agency.

LEED® credits - Material resources: BUILDING PRODUCT DISCLOSURE AND OPTIMIZATION - SOURCING OF RAW MATERIALS

In category “**Material Resources**”, the credit “**Building Product Disclosure And Optimization - Sourcing Of Raw Materials - Option 2: Leadership Extraction Practices (1 point)**” aims at promoting the use of products and materials which have environmentally, economically, and socially preferable life cycle impacts.

LEED requirement

LEED requires that recycled material is incorporated in the product for at least 25%, by cost. Recycled content (RC) is valued as follows:

$$RC = post - consumer RC + \frac{1}{2} pre - consumer RC,$$

based on cost.

ATENA contribution

ATENA can contribute to this credit since secondary raw material, both from post-consumer and pre-consumer source, is already incorporated in its products.

Documentation required

Depending on the products, ATENA can provide the specific amount of recycled content in the product.

LEED® credits - Material resources: CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

In category “**Material Resources**”, the credits “**Construction And Demolition Waste Management - Option 1: Diversion (1-2 points)**” or “**Option 2: Reduction of Total Waste Material (2 points)**” aims at reducing waste disposed in landfills and incineration facilities by implementing recovering, reusing, and recycling strategies of the materials generated upon construction and demolition operations.

LEED requirement

LEED requires to divert C&D* waste from landfill or incineration by adopting recycling schemes of non-hazardous materials. Depending on the amount of diverted waste and number of material typologies, different points are awarded.

ATENA contribution

ATENA can contribute to this credit by using recyclable packaging for its products.

Documentation required

ATENA currently uses recyclable packaging (film, pallet and metallic strapping)

*Construction & Demolition.

LEED® credits – Indoor Environmental Quality

The Indoor Environmental Quality credit category focuses on rewarding buildings with improved indoor environmental quality by using products which have low to zero emissions during the use phase, especially as far as VOCs are concerned.

Credits and points for the category **Indoor Environmental Quality** are shown in the image below.

0	0	0	Indoor Environmental Quality	16
Y			Prereq Minimum Indoor Air Quality Performance	Required
Y			Prereq Environmental Tobacco Smoke Control	Required
			Credit Enhanced Indoor Air Quality Strategies	2
			Credit Low-Emitting Materials	3
			Credit Construction Indoor Air Quality Management Plan	1
			Credit Indoor Air Quality Assessment	2
			Credit Thermal Comfort	1
			Credit Interior Lighting	2
			Credit Daylight	3
			Credit Quality Views	1
			Credit Acoustic Performance	1

Products can contribute to point achievement in the credits:

1. Low-emitting materials.

LEED® credits – Indoor Environmental Quality: Low emitting materials

In category “**Indoor Environmental Quality**”, the credit “**Low-emitting materials (1-3 points)**” aims at rewarding buildings with products which have determined volatile organic compound (VOC) emissions in the indoor air and the VOC content of materials, as well as the testing methods by which indoor VOC emissions are assessed.

LEED requirement

LEED has set thresholds on VOC emissions and content for different categories of materials. Those of interest for ATENA are ceilings/walls categories.

ATENA contribution

ATENA products can contribute to this credit since they can be used for ceilings:

1. Not painted ceilings, i.e. those which do not include organic-based surface coatings, automatically comply with LEED requirements.
2. Painted products can comply depending on VOC emissions and content.

Documentation required

1. For not painted products, no additional documentation is required since are defined by GBC as “inherently non-emitting sources” of VOCs.
2. For painted products, a VOC test compliant with available standards has been carried out, showing minimal emissions. Such document is available upon request.

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Please note that, since ATENA products under analysis have the same composition and application, credits are valid across all product typologies, unless otherwise specified.



Materials & Resources

1. Purchasing—facility maintenance and renovation
2. Solid waste management—facility maintenance and renovation

LEED® credits – Material and Resources

The Materials and Resources credit category focuses on reducing the environmental harm from materials purchased, used, and disposed of in the operations within buildings.

Credits and points for the category **Material Resources** are shown in the image below.

0	0	0	Materials and Resources		8
Y			Prereq	Ongoing Purchasing and Waste Policy	Required
Y			Prereq	Facility Maintenance and Renovations Policy	Required
			Credit	Purchasing- Ongoing	1
			Credit	Purchasing- Lamps	1
			Credit	Purchasing- Facility Management and Renovation	2
			Credit	Solid Waste Management- Ongoing	2
			Credit	Solid Waste Management- Facility Management and Renovation	2

Products can contribute to point achievement in the credits:

- **Purchasing—facility maintenance and renovation**
- **Solid waste management—facility maintenance and renovation**

LEED® credits – Material resources: PURCHASING—FACILITY MAINTENANCE AND RENOVATION

In category “**Material Resources**”, the credit “**Purchasing—facility Maintenance And Renovation: Option 1. Products and Materials (1-2 points)**” aims at reducing the environmental harm from materials used in building renovations.

LEED requirement

In case of renovation, LEED requires to purchase at least 50%, by cost, of the total maintenance and renovation materials that meet at least one of the following criteria:

1. Recycled content

2. Materials reuse

3. International Alternative Compliance Path – REACH Optimization

4. Low emissions of volatile organic compounds

ATENA contribution

ATENA’s products incorporates recycled material, do not include substances in the REACH list and have low emissions of VOC. Additionally, each item can be easily dismantled and reused.

Documentation required

1. Recycled content is provided by ATENA upon request

2. Materials reuse is made possible by the ease of dismantling of ATENA’s products

3. Absence of SVHC is proved by available bill of materials

4. Low emissions of VOC are assessed by available standards

LEED® credits – Material resources: SOLID WASTE MANAGEMENT—FACILITY MAINTENANCE AND RENOVATION

In category “**Material Resources**”, the credits “**Solid Waste Management—facility Maintenance And Renovation (2 points)**” aims at diverting construction, renovation, and demolition debris from disposal in landfills and incinerators and recover and recycle reusable materials.

LEED requirement

LEED requires to divert at least 70% of the waste (by weight or volume) generated by facility maintenance and renovation activities from disposal in landfills and incinerators.

ATENA contribution

ATENA can contribute to this credit since false ceilings and related elements are mainly constituted by metals (steel and aluminium) and can be easily sent to recycling facilities.

Documentation required

None.

Recap – BDC credits for ATENA’s products

The table below reports a recap of LEED credits applied to ATENA products within the scope of the BDC protocol.

Product	Material and resources			Indoor Environmental Quality
	Material Ingredient	Sourcing of raw materials	Construction and demolition	Low-emitting material
T-grids	✓	✓	✓	✓
Metal tiles ceilings	✓	✓	✓	✓
Metal staves ceilings	✓	✓	✓	✓
Metal baffle ceilings	✓	✓	✓	✓
Metal mesh ceilings	✓	✓	✓	✓
Open Cells ceilings	✓	✓	✓	✓
Special shapes ceilings	✓	✓	✓	✓
Floating island ceilings	✓	✓	✓	✓
Healthcare ceilings	✓	✓	✓	✓
Partition wall systems	✓	✓	✓	✓
Channels and profiles for dry construction systems	✓	✓	✓	✓

Recap – EBOM credits for ATENA’s products

The table below reports a recap of LEED credits applied to ATENA products within the scope of the EBOM protocol.

Product	Material and resources	
	Purchasing—facility Maintenance And Renovation	Solid Waste Management—facility Maintenance And Renovation
T-grids	✓	✓
Metal tiles ceilings	✓	✓
Metal staves ceilings	✓	✓
Metal baffle ceilings	✓	✓
Metal mesh ceilings	✓	✓
Open Cells ceilings	✓	✓
Special shapes ceilings	✓	✓
Floating island ceilings	✓	✓
Healthcare ceilings	✓	✓
Partition wall systems	✓	✓
Channels and profiles for dry construction systems	✓	✓