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ENHANCING CAPACITY FOR LOW EMISSION DEVELOPMENT STRATEGIES (EC-LEDS) CLEAN ENERGY PROGRAM

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REPORT ON PRELIMINARY VERSION OF GB RATING AND CERTIFICATION SYSTEM FOR GEORGIA FOR OPERATION AND MAINTENANCE OF EXISTING BUILDINGS



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DISCLAIMER

The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

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ACRONYMS

Acronym	Full name
BRE	Building Research Establishment
BREEAM	Building Research Establishment Environmental Assessment Method
CO ₂	Carbon Dioxide
CFC	Chlorofluorocarbon
HCFC	Hydrochlorofluorocarbon
EC-LEDS	Enhancing Capacity – Low emission Development Strategy project
GB	Green Building
GBC	Green building council
LEED	Leadership in Energy and Environmental Design
M	Metre
NO _x	Nitrogen Oxide
Kg	Kilogram
USAID	US Agency for International Development
VOC	Volatile Organic Compound
Sq. m.	Square Metre
SRI	Solar Reflectance Index
WGBC	World Green Building Council
Pa	Pascal
RS	Rating System

EXECUTIVE SUMMARY

Green Building Rating System for Georgia is developed to rate and certify existing green buildings. The RS is developed based on the international practice of the asset's and its operation and maintenance assessment. It covers the building/site itself, as well as its management scheme.

Green building industry over the world applies many rating tools. Mainly internationally there are used LEED and BREEAM. Many countries operate also local rating tools, adapted specifically for their needs. However, currently in Georgia there are very few green building professionals. Thus, there is need to have local rating system easily usable by Georgian experts. This will allow medium and small scale projects to be certified locally, which would not happen if using international rating systems due to their complexity and high cost.

Creation of this rating system is the first attempt in Georgia to develop the tool for green buildings. Its primary purpose is to measure how green is a particular building. Also it can be used as good practice guidance for building industry.

The rating system addresses almost all parts of environmental performance, such as site selection and transportation, energy and water use, materials and indoor environment, waste and building management. The rating system is based on the following three types of requirements:

- numerical or narrative requirement, the value or concept of which is given in the text;
- numerical or narrative requirement to which is to be calculated or shown by the applicant
- numerical or narrative requirement used in third party standard, guide or other reference materials.

The system, on the one hand, is designed to be simple and usable by average skilled Georgian expert; on the other hand, it is designed to cover as many environmental issues as possible. After pilot certification of several buildings there will be identified need for its further update. Eventually, as Georgian green building market increases and average level of Georgian green building professionals goes up, the rating system can develop towards more complexity. This also will be supported by local built environment related legislation, which, as a result of Eurointegration process, is expected to become more environmentally sound.

Assessment of the building is based on the credits system. There are optional and mandatory credits. Achievement of all credits is very difficult, so the applicant has to choose those which are easier achievable for the particular building. As for mandatory credits, they are designed to identify minimum requirement, below which the building can not be claimed to be green, e.g., minimum energy efficiency or management of hazardous materials. In some credits, number of achievable scores is one or more. This is to stimulate better performance where possible.

After testing of this rating system the next step will be development of the rating system for new building and renovation/reconstruction projects. Finally, there will be created rating systems for particular types of buildings such as schools, homes, building blocks, hospitals, retail, offices etc.

SECTION ONE: INTRODUCTION

The buildings account for the major part of the consumed energy and CO₂ emissions by industry sectors in the world. The figures vary from region to region, but an average is up to 40% (Source: World Green building Council. <http://www.worldgbc.org/about-worldgbc/who-we-are>). Green building practice, widely developed in recent decade of years, plays important role in both, environmental and economic sustainability. Reducing building environmental footprint and demand for fossil resources, increases energy security of the countries/regions and results in economic growth. The World Green Building Council (WGBC), together with country based green building councils (GBCs) is leading this process, promoting sustainable building and communities practice already in more than 118 countries.

Within the framework of the USAID funded EC-LEDS program, implemented by Winrock International, Winrock's local partner GBC Georgia has developed the first version of Georgia rating system for existing green buildings. The rating systems all over the world are the main tools/instruments for green building market which benchmarks building performance and quantifies it, comparing buildings to each other.

The overall goal of this tool is technical assistance to building and real estate market in sustainable building and communities' delivery and operation practice, as well as bringing the processes to low energy and environmentally friendly mainstream. By applying multi-disciplinary approach in ownership, operation and maintenance of the existing building stock, it aims to:

Set the standard for best practice in sustainable design and measure building's energy and environmental and performance.

Provide for building developers, owners and operators a concise framework for identifying and implementing practical and measurable green building design, construction, operation and maintenance solutions.

Provide for construction sector participants essential and sufficient tool for environmentally friendly building stock production and operation

Specifically, developed rating tool targets at:

(a) Support of Georgian real estate market by providing measurable third-party verification that a building or community is/was designed built and operated/managed using strategies aimed at improving performance across all the metrics that matter most:

- energy savings,
- water efficiency,
- CO2 emissions reduction,
- improved indoor environmental quality,
- stewardship of resources and sensitivity to their impacts.

(b) Transfer of technology and knowledge to Georgian professionals how to:

- operate and maintain new and existing green buildings
- market the green building stock

(c) Transfer and adaptation of good environmental practice to Georgian legislative, cultural and technical backgrounds, enriching green building knowledge and good practice by Georgia specific issues:

- easy use of building rating resources by wide range of local engineering professionals (mid age/experienced, different professions and backgrounds – with little or no specific environmental knowledge)
- identification of sensible region specific energy and other environmental targets
- development of region/sub region specific water and material use approaches
- study and apply national / sub regional energy carbon indexes
- identification of specific regional environmental footprints
- optimization of good energy and environmental practice to fit built environment cultural traditions of the regions.

SECTION TWO: NEXT STEPS

The rating system needs to be tested at least on several sites. Also proper certification procedures are to be set up. Certification process will show what is needed to be added or improved in certification procedures itself, as well in the system of scoring.

Also, it is envisaged that there will happen substantial legislative base improvement in the built environment sector, which is to be reflected also. As the nationwide mandatory requirements for buildings construction and operation go stricter, the meaning of green building will also be updated referring to a building of better performance than required by law.

For successful operation of the rating system as a tool for the market, it is crucial to support professionals' qualification so that large numbers of engineers, architects, managers etc are able to use it. For this purpose specifically designed training programs are to be implemented. As the general level of professional skills increases, it will become possible to make the rating system more complex covering wider range of issues and requiring more precise calculations or measuring.

As next step, there will be developed a separate rating system for new buildings and renovations/reconstruction. Finally, there will be created rating systems for particular types of existing and new buildings such as schools, homes, building blocks, hospitals, retail, offices etc.

SECTION THREE: RS TOOL

A SITE LANDSCAPE AND LOCAL ENVIRONMENTAL ISSUES			
A-01		Preserved topsoil and planted area	
Number of Credits available:	2-5	Type of credit:	Mandatory <u>Optional</u>
Background / aim:			
To protect topsoil and vegetation, protect and restore vegetation, support the wildlife.			
Issue:			
What percentage of the site total landscape area is preserved or restored?			
Performance indicator:			
Top soil preserved (vegetated or not vegetated):			
25% - 1 credit			
40% - 2 credits			
60%– 3 credits			
100% - 4 credits			
150% - 5 credits			

Note:

- (a) green roofs and built soil surfaces are count by factor 0.7
- (b) restored black field area is counted by factor 2.0
- (c) restored brown fields area is counted by factor 1.5

Means of Verification:

1. Site plan/s with dimensions

and

2. Area calculation table

3. Site photos

Additional requirements if black or brown field is restored:

- 1. Document verifying site condition before development / redevelopment
- 2. Document verifying conducted works and current site condition, e.g. environmental assessment Report Stage 1,2,3,4,5 or equivalent.

Guidance / implementation strategy:

Avoid land use for non-building purposes, install green roofs.

When occupying the site, give preference to restored black fields and brown fields.

Additional information:

A SITE LANDSCAPE AND LOCAL ENVIRONMENTAL ISSUES

A-02	Light Pollution
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Number of Credits available:	1	Type of credit:	Mandatory <u>Optional</u>
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Background / aim:

To minimize amount of light passed from the on-site sources to the site landscape and outside the site boundary

To protect nocturnal environment, to protect clear night sky.

Performance indicator:

Requirement 1:

All interior lighting fixtures are designed and installed so that the light source (e.g. bulb) and its transparent covers are not visible from the exterior.

Requirement 2:

No exterior luminary passes the light above horizon surface

Means of Verification:

1. Visual inspection report
2. Site photos (night condition)

Guidance / implementation strategy

Avoid using of horizontally oriented light sources, also light trespass to the sky.

Use translucent covered luminaries in the interior or place them in invisible from outside places.

Additional information:

Emergency lighting system is exempt from the requirements.

A SITE LANDSCAPE AND LOCAL ENVIRONMENTAL ISSUES			
A-03		Flood Risk Management	
Number of Credits available:	1-2	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To manage the risk associated with site flooding</p>			
<p>Performance indicator:</p> <p>Option 1: The site is located in no flood risk zone area - 2 credits.</p> <p>Option 2: The site is located in flood risk zone area. The flood risk is considered in site design – 1 credit.</p> <p>Option 3: The site is located in flood risk zone area. The site has flood risk management plan – 1 credit</p> <p>Option 4: The site is located in flood risk zone area. The flood risk is considered in site design. The site has flood risk management plan – 2 credits</p>			
<p>Means of Verification:</p>			

1. Regional flood risk map issued by state authorities or flood risk assessment study by qualified institution or expert.
2. Flood risk management plan for the site
3. Evidence of the flood Management Plan's implementation
4. Site design documents.

Guidance / implementation strategy

Select the sites located above the minimum flooding level

Plan to manage the risk caused by possible flooding.

Additional information:

A SITE LANDSCAPE AND LOCAL ENVIRONMENTAL ISSUES			
A-04		Land Use and Management Plan	
Number of Credits available:	1-2	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>Protect and restore site's original landscape, protect land's ecological value, provide sustainable hardscape operation, support of the building's sustainable operation.</p>			
<p>Performance indicator:</p> <p>Site landscape management planning, covering as minimum the following topics:</p> <ul style="list-style-type: none"> - storm water management - waste management - soil erosion - harmful substances management and waste - air pollution 			
<p>Means of Verification:</p> <ol style="list-style-type: none"> 1. Site landscape management plan or equivalent document 2. Evidence of the management operations (photos, reports, sub contractor agreements...) 			
<p>Guidance / implementation strategy:</p> <p>Manage the storm water run off from the site by applying water detention facilities, maximize permeable surfaces, protect and restore sites vegetation. Use natural fertilizers and other materials;</p>			

avoid use of hazardous chemicals for different purposes.

Additional information:

A SITE LANDSCAPE, AND LOCAL ENVIRONMENTAL ISSUES

A-05	Refrigerants Management Plan		
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Number of Credits available:	1-2	Type of credit:	<u>Mandatory</u> <u>Optional</u>
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Background / aim:
 To reduce environmental impact caused by use of refrigerants

Performance indicator:

Requirement 1:
 Have refrigerants management plan addressing as minimum refrigerants leakage monitoring and disposal, also planned, emergency and preventive maintenance issues for equipment using refrigerants to prevent waste / leakage.

Requirement 2:

Option 1. 3 credits
 No refrigerants are used

Option 2 . 1 credit
 No CFC used as refrigerant. HFCs, HCFC group refrigerants are used.

Option 3. 2 credits

No CFC is used as a refrigerant. No HFCs or HCFC group refrigerants are used. Propane, Butane refrigerants or lower global warming potential refrigerants can be used.

Means of Verification:

1. Equipment documentation showing used refrigerant type and global warming potential. (options 2 and 3)
2. Building owners/operator's letter stating that there are no refrigerants or no CFC refrigerants used on site. (Options 1 and 2)
3. Refrigerants management plan / organization's policy.

Guidance / implementation strategy:

Avoid use of refrigerants. If used, select those with lower Ozone depletion and global warming potentials. Ensure that the leakage is minimized, and after completing the life cycle the equipment is disposed in a proper way.

Additional information:

A SITE LANDSCAPE AND LOCAL ENVIRONMENTAL ISSUES

A-06

Heat Island

Number of
Credits
available:

1

Type of credit:

Mandatory

Optional

Background / aim:

Reduce overheating of the surfaces, protect site microclimate.

Performance indicator:

One credit for each requirement achieved:

Requirement 1

Apply green roof for 50 % of all roofs footprint or use high SRI roof materials for 70 % of the roof footprint.

Requirement 2

Shade 50 % of the walkways, car parks and other landscape area with trees or shading devices having high SRI.

Note: For the roofs having more than 20 degrees slope and facing from NE to NW the SRI should be at least 30. For all other roofs, – at least 75.

Means of Verification:

Site plans, including building and roofs footprint, also materials specification.

Site photographs.

Guidance / implementation strategy:

Avoid overheating of the surfaces, use higher solar reflective index (SRI) materials, shade the surfaces by planting trees or applying shading structures. Use green roof. For walkways and site roads use reflective and light color pavement. Plant trees, use light color pavement. Use high SRI roof materials and green roofs.

Additional information:

Open verandas and terraces are counted as roofs, if not covered by a structure.

A SITE LANDSCAPE AND LOCAL ENVIRONMENTAL ISSUES			
A-07		NOx Emission	
Number of Credits available:	I	Type of credit:	Mandatory <u>Optional</u>
Background / aim:			
Prevent site and global environmental pollution by emitting dry NOx into atmosphere.			
Performance indicator:			
Requirement:			
Do not use appliances emitting dry NOx as a result of fuel burning.			
Means of Verification:			
Description of heating system, equipment specifications by manufacturer, photos of the equipment.			
Guidance / implementation strategy:			
Do not use appliances burning coal, gas, oil products or use higher quality appliances, having no or low NOx emission specified.			

Additional information:

A SITE LANDSCAPE AND LOCAL ENVIRONMENTAL ISSUES			
A-08		Green landscape	
Number of Credits available:	2	Type of credit:	Mandatory <u>Optional</u>
Background / aim:			
To protect site's natural habitat			
Performance indicator:			
Option 1 – 1 credit Planted/vegetated 40% of the site's total area			
Option 2 – 1 additional credit Planted/vegetated 60% of the site's total area			
Means of Verification:			
Photos, site plan			

Guidance / implementation strategy:

Plant local or adapted plants, minimize hardscape area on the site.

Additional information:

Note: only local and adapted plants can count. This can be trees or shrubs. Grass surface does not count.

A SITE LANDSCAPE AND LOCAL ENVIRONMENTAL ISSUES			
A-09		Protection of the Existing Vegetation and/or Fauna	
Number of Credits available:	I	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce negative environmental impact on occupants, to protect the vegetation and wild life during development and operation of buildings.</p>			
<p>Performance indicator:</p> <ul style="list-style-type: none"> - The site is developed protecting existing trees, shrubs and grass by maintaining or re-planting to other safe place, - The site has management plan preventing cutting trees and shrubs or has in place and implements re-planting policy. - The site has in place and implements plan for protection of wild life (birds, insects) 			
<p>Means of Verification:</p> <p>Documentation on site development (photos, sub contracts, photos of re-planted items)</p> <p>Management/maintenance plan including vegetation and wild life protection issue.</p>			
Guidance / implementation strategy:			

Give preference to the sited developed according to vegetation and wildlife protection policy. Do not remove existing vegetation from the site. If it is unavoidable – re-plant it to other safe place. If wild life shelter or other necessary environment is affected, provide the adequate one instead (e.g. nests, water ponds).

Additional information:

B SITE SELECTION AND TRANSPORTATION

B-01

Cyclist Friendly Site

Number of Credits available:	2	Type of credit:	Mandatory <u>Optional</u>
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Background / aim:

Stimulation of bicycle transportation to/from home or work.

Performance indicator:

This credit is available only in cyclist friendly cities, city districts or rural areas.

Requirement 1 - 1 credit

Secure bicycle racks, as minimum 1 rack for 70 sq. meter of 1-210 sq. m building area and 1 rack for each additional 200 sq meter area

Requirement 2 – 1 additional credit

Changing facilities and showers – one for the first 5 racks, and 1 for additional 15 racks

Means of Verification:

1. Review of the city and district cycle facilities, including road safety analysis.
2. Site photos with cyclist facilities

3. Site Plans showing cyclist facilities and areas.

Guidance / implementation strategy:

Apply safe cyclist racks. Provide shower and changing facilities for cyclists.

Additional information:

Safety compliance / level of safety requirements for the racks are to be considered in the city / district review.

B SITE SELECTION AND TRANSPORTATION

B-02	Access to facilities
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Number of Credits available:	1-2	Type of credit:	Mandatory <u>Optional</u>
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Background / aim:

To minimize travel and increase site occupancy comfort by closeness of infrastructure facilities

Performance indicator:

Option 1 - 1 credit

The site is located in the distance of maximum 750 meters from the basic services:

Food store / market or super market -

Option 2 (in addition to Option 1 requirement) – 1 additional credit

The site is located in the distance of maximum 750 meters from at least 2 services from listed below:

cafeteria/restaurant, bank, laundry shop, other shops

Means of Verification:

1. Site master plan indicating routes with distances

2. Photos of the site's main entrance and facilities.

Guidance / implementation strategy

Choose the site in close distance to basic services

Additional information:

The distance is counted from the site main entrance. Distance is counted only following the pedestrian routes.

B SITE SELECTION AND TRANSPORTATION

B-04

Public Transport Access

Number of Credits available:	1-4	Type of credit:	Mandatory <u>Optional</u>
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Background / aim:

Stimulate transportation to and from the site using public transport

Performance indicator:

Option 1. (for non-dwellings) – 1 credits

Bus or minibus service, on working days to and from the site.

Option 2. 2-4 credits

Distance from the site to subway station:

0-500 meters – 4 credits, 501-750 meters – 3 credits, 751-1000 meters – 2 credits

Option 3 – 1-4 credits

Public transport: bus, mini bus, trolley bus, ropeway (cable road)

Distance from the site to public transport stop / Frequency of service in Minutes in peak hours	0-15 minutes	16-30 minutes	30-45 minutes	more than 45 minutes
601-1000 m	1 credit	-	-	-
301- 600m	2 credits for 1 route 3 credits for 2 or more routes	1 credits for 1 route 2 credits for 2 or more routes	- 1 credits for 2 or more routes	-
0-300m	3 credits for 1 route 4 credits for 2 or more routes	2 credits for 1 route 3 credits for 2 or more routes	1 credits for 1 route 2 credits for 2 or more routes	- 1 credits for 2 or more routes

Note for option 1: Transport service should be provided to the public transport stop of at least 15 minutes frequency or to subway station.

Note for options 2 and 3.

Distance is calculated by pedestrian route, no straight lines are accepted for calculation. Street crossing in calculations is allowed only in especially designed crossings.

Means of Verification:

Map of the area

Photographs

Certified public transport schedule (for option 3)

Guidance / implementation strategy:

Select the site close to public transport stops; arrange special bus service to and from the site.

Additional information:

B SITE SELECTION AND TRANSPORTATION

B-05

Distance to social infrastructure

Number of Credits available:	1-5	Type of credit:	Mandatory <u>Optional</u>
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Background / aim:

Minimize number of journeys by vehicle, stimulate walking

Performance indicator:

Distance from the site to the facility / Name of the facility	Food store, Cafeteria	Drug store, restaurant, ATM, Other shops	Kindergarten School (applicable for dwellings only)	Bank
1000-1500m	-	1 credit	1 credit	1 credit
601-1000 m	-	2 credits	1 credit	1 credit
301- 600m	1 credit	2 credits	1 credit	1 credit

0-300m	2 credits	2 credits	1 credit	1 credit
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Note for option 1: Transport service should be provided to the public transport stop of at least 15 minutes frequency or to subway station.

Note:

In case of multiple facilities credits can be added.

Distance is calculated by pedestrian route, no straight lines are accepted for calculation. Street crossing in calculations is allowed only in especially designed crossings.

Means of Verification:

Map of the area

Photographs

Guidance / implementation strategy:

Select the site close to the indicated services

Additional information:

B SITE SELECTION AND TRANSPORTATION

B-06

Applicable to sites over 1500 sq.m. total building area or 5000 sq.m. of land area.

Pedestrian Safety

Number of

2

Credits available:

Type of credit:

Mandatory

Optional

Background / aim:

To provide safe movement of vehicles and people on the site.

Performance indicator:

The site has safe pedestrian access from the street and from car park. Pedestrian routes from the street to main entrance does not intersect with vehicle routes. Pedestrian routes from car park to building entrance does not intersect with vehicle routes or has safe crossing.

Means of Verification:

Site plan

Photographs

Guidance / implementation strategy:

Provide safe pedestrian access to the site and to car park.

Additional information:

C ENERGY

C-01

Energy Management

Number of

Credits available:

1-4
(1 mandatory)

Type of credit:

Mandatory

Optional

Background / aim:

To establish effective energy management strategy in building's operation..

Performance indicator:

Option I

Show verified operational performance of the building using Display tool (www.display-campaign.org).

Demonstrate the following annual energy consumption rating:

A- 15 credits

B- 10 credits

C- 5 credits

Option 2

Use other tool or guidance, demonstrating the equivalent energy consumption. The tool has to be reviewed and approved by rating system operator.

Means of Verification:

Display report

Verification documents for building occupancy and indoor thermal comfort

Utility consumption verification: bills, mere readings.

Guidance / implementation strategy:

Apply energy efficient heating and cooling equipment.

Utilize solar and other available renewable energy.

Apply efficient building envelope.

Additional information:

C ENERGY			
C-02		Water supply energy	
Number of Credits available:	2	Type of credit:	Mandatory <u>Optional</u>
Background / aim:			
To stimulate energy reduction by supplying water from zero energy source			
Performance indicator:			
Use water supply from the sources not requiring energy, e.g. self flow system.			
Means of Verification:			
Description of the water supply source			
Statement on zero energy water supply or water supply system drawings (if supplied by water company)			
Guidance / implementation strategy:			
Connect to self flow water supply system, if available, use the water well operated using human			

energy.

Additional information:

Water well can be considered for the sites with gross area less than 100 sq. meters.

D WATER USE			
D-01		Sub metering of water items	
Number of Credits available:	1	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To support water consumption management within the site</p>			
<p>Performance indicator:</p> <ol style="list-style-type: none"> 1. Sub metering of all major water consumption zones, as minimum kitchens, WCs, bathrooms, car washes, vegetation watering. 2. Record and monitor water consumption data 			
<p>Means of Verification:</p> <p>Site plans showing occupancy zones and water supply mains, meters</p> <p>Photos of the occupancy zones and meters</p>			
<p>Guidance / implementation strategy:</p>			

Identify major water consumption areas,

sub meter the consumption zones

Keep records of water use by zone

Take follow up action if a zone water consumption increases unexpectedly.

Additional information:

At least one year water consumption records are to be kept.

D WATER USE			
D-02		Efficient Plumbing Items	
Number of Credits available:	2	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>Reduction of water consumption through efficient plumbing items</p>			
<p>Performance indicator:</p> <p>All plumbing items installed on the site meet requirements of International Plumbing Code 2006 edition</p>			
<p>Means of Verification:</p> <p>Site plans showing plumbing items and their location</p> <p>Manufacturer's specification for plumbing items</p> <p>Photos of plumbing items</p>			

Guidance / implementation strategy:

Use the compliant plumbing items

Additional information:

D WATER USE			
D-03		Local or adapted landscape	
Number of Credits available:	1	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce use of water resources for irrigation</p>			
<p>Performance indicator:</p> <p>Use vegetation requiring no irrigation.</p>			
<p>Means of Verification:</p> <p>Site photos, master plan</p> <p>Description of the plants.</p>			
<p>Guidance / implementation strategy:</p> <p>Use natural for the region or adaptive plants requiring no irrigation.</p>			

Avoid use of invasive species.

Additional information:

Credit can not be applicable to sites with total planted landscape area (including green roofs) less than 10% of the site area.

Only trees can be considered for vegetation for the purpose of this credit. Shrubs and grass can not be considered to earn this credit.

D WATER USE			
D-04		Leak Prevention	
Number of Credits available:	I	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce water waste caused by leaking through damaged pipework or appliances</p>			
<p>Performance indicator:</p> <p>All major consumption areas are equipped with water leak detection systems.</p> <p>Major consumption areas cover but can not be limited with toilets, bathrooms, kitchens, laundries. If the similar type consumption areas (e.g. several toilets in public buildings) are located in adjacent spaces, shared leak detector can be compliant.</p> <p>For home buildings and hotels the leak detectors are to be installed at least in kitchen, toilets, bathrooms, laundries. For homes of less than 100 sq. m. area one leak detector connected to main valve is compliant.</p>			
<p>Means of Verification:</p> <p>Site plans showing water consumption and detection zones.</p>			

Photos of leak detectors, specifications of leak detectors.

Guidance / implementation strategy:

Identify major water consumption zones.

Group the similar zones together if located in adjacent areas.

Install water leak detectors separately for each major consumer.

Additional information:

D WATER USE			
D-05		Water reuse	
Number of Credits available:	2	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce water consumption through utilizing used water rain water.</p>			
<p>Performance indicator:</p> <p>OPTION I</p> <p>10% of all water use is from recycled or harvested source</p> <p>Option 2</p> <p>30% of all water use is from recycled or harvested source</p> <p>Option 3</p> <p>50% or more of all water use is from recycled or harvested source</p>			

Means of Verification:

Meter readings and calculations report

Photos of rain water collection or/and recycling systems

Guidance / implementation strategy:

Maximize use grey or black water

Maximize collection and use of rain water.

Additional information:

Any ground or river source water can not be claimed as harvested.

D WATER USE			
D-06		Water management plan	
Number of Credits available:	I	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce on site water use by proper management scheme</p>			
<p>Performance indicator:</p> <p>The site has in place and implements proper water management plan, as minimum covering the following issues:</p> <ul style="list-style-type: none"> - annual and seasonal water consumption monitoring - on-site extraction measuring and monitoring - leak detection plan - consumption by areas - water consumption reduction plan - water items maintenance strategy 			
<p>Means of Verification:</p>			

Consumption records

Water Management Plan

Report on implemented measures

Guidance / implementation strategy:

Develop water management strategy and identify the actions.

Apply external consultant or use a sample water management plan.

Additional information:

Single family dwellings, also sites of less than 250 sq. meter gross floor area can not earn this credit.

E RESOURCES / MATERIALS			
E-01		Green Procurement	
Number of Credits available:	2	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce negative environmental footprint of building occupancy through sustainable supply of materials and items.</p>			
<p>Performance indicator:</p> <p>Have in place and implement sustainable procurement strategy and respective action plan/s addressing as minimum the following issues</p> <ul style="list-style-type: none"> - selection of materials and supplies considering environmental footprint of the products, such as embodied energy, reused and recycled content, recyclability, production distance, environmental hazard, responsible sources etc. - selection of vendors taking into account their environmental policies - environmental quality targets for procured products and goods <p>If the building is occupied by several businesses then the owner can suggest a standard procurement strategy and action plan to building occupants, however, the credit will be earned based in its implementation.</p>			
<p>Means of Verification:</p> <p>Strategy document and an action plan, report on implementation.</p>			

Guidance / implementation strategy:

Develop sustainable procurement strategy for the building occupant. Base on th strategy develop and implement procurement action plan/s for different types of purchases. The action plan should consider specific issues of the business occupying the building.

Additional information:

Single family dwellings, also sites of less than 250 sq. meter gross floor area can not earn this credit.

E RESOURCES / MATERIALS			
E-02		Site structural survey	
Number of Credits available:	1	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To ensure efficiency of building fabric use, reduce environmental impact caused by possible need for reconstruction/refurbishment/repair.</p>			
<p>Performance indicator:</p> <p>The building has conducted structural survey by qualified surveyor individual or institution. The recommendations of the survey are addressed.</p> <p>The survey must address the following issues as minimum:</p> <ul style="list-style-type: none"> - general condition of the building structures - assessment of the seismic risk, based on building condition and calculations / assessment against current seismic hazard - findings and recommendations <p>The visual survey must be conducted at least once in 5 years.</p> <p>Instrumental survey and calculations must be conducted at least in 20 years or less, if identified by visual survey recommendations.</p>			

Means of Verification:

Survey report,

Proof of the conducted structural works - design, materials purchase documents, contract documents, photographs - (if recommended by survey)

Guidance / implementation strategy:

Keep the building in good structural condition, identify defects and deficiencies. Follow the recommendations of the structural survey.

Additional information:

Single family dwellings, also sites of less than 250 sq. meter gross floor area can not earn this credit without instrumental survey, if the visual survey identified no need for it.

E RESOURCES / MATERIALS

E-03

Flexible structures

Number of
Credits
available:

1

Type of credit:

Mandatory

Optional

Background / aim:

To support flexibility in building occupancy and to reduce need for major renovations and reconstruction.

Performance indicator:

The building has partitions, luminaries, power outlets, water supply items easily movable to enable space modification.

Means of Verification:

Photographs of the luminaries, power outlets, partitions, water supply items.

Floor plans showing partitions location and flexibility (materials)

Guidance / implementation strategy:

Select buildings with maximum flexible design, able to support occupancy change.

Additional information:

Non-bearing building structural elements are considered as partitions.

F HEALTH AND WELL BEING

F-01

Tobacco Smoke and Contaminated Air Control

Number of
Credits
available:

1

Type of credit:

Mandatory

Optional

Background / aim:

to reduce negative impact on building occupants caused by tobacco smoke and other polluted air

Performance indicator:

Requirement 1

The building has in place and implements non-smoke policy in permanently occupied areas. Smoking is prohibited within the distance of 9 meters from the building envelope outer boundary voids (windows, doors, balcony doors etc).

Requirement 2.

If the building has special designated areas for smokers, also the spaces generating polluted air - the building services provide permanent negative pressure of 1 Pa so that polluted air can not penetrate to permanently occupied areas. Access to smoking spaces have to be provided through open air or a cubicle with air sealed self closable doors from both sides.

Requirement 3 (for mechanically ventilated spaces)

Mechanical ventilation does not allow air recirculation from smoking and other polluted spaces.

Means of Verification:

Building occupancy policy document

Drawings and specifications of ventilation system (in case of negative pressure spaces are applied)

Guidance / implementation strategy:

Prohibit smoking within the building, apply non-smoking policy

Provide designated areas for smokers and for the equipment generating polluted air.

Additional information:

As minimum, the following processes are considered as polluted air generating:

- copier machines,
- network printers,
- laundries of more than 25 Kg total capacity.
- areas where adhesives, glues paints and other chemicals are used

Single family home buildings are exempt from the requirement 1 of this credit.

F HEALTH AND WELL BEING			
F-02		Cleaning policy and implementation	
Number of Credits available:	I	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To ensure safe occupancy by implementation of cleaning policy</p>			
<p>Performance indicator:</p> <p>The building management has in place and implements cleaning policy covering as minimum: daily cleaning issues, weekly and deep cleaning schedule, requirements for cleaning materials, storage of cleaning materials, disposal of cleaning materials, staff responsibilities.</p>			
<p>Means of Verification:</p> <p>Cleaning policy document, photos of cleaning materials storage, rent agreements (if any)</p>			
<p>Guidance / implementation strategy:</p>			

Implement sustainable cleaning policy for the asset. If the asset is rented out to several tenants, then make sure that the tenants or facilities managers implement sustainable cleaning policy.

Additional information:

F HEALTH AND WELL BEING

F-03

Ventilation

Number of Credits available:	I	Type of credit:	Mandatory <u>Optional</u>
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Background / aim:

To provide healthy environment for building occupants through supply of fresh air.

Performance indicator:

Option 1 (naturally ventilated and mixed mode ventilated buildings)

Requirement 1. All of the building floors have through ventilation either from opposite sites or from angle sides (two adjacent facade edges).

80% of permanently occupied spaces have natural ventilation, with openable door or window of at least 5% of the floor area.

Option 2 (mechanically ventilated buildings)

Building management provides operation of the ventilation system, fresh air supply is provided according to facilities management plan.

The ventilation system is designed and operated according to local construction norm/s.

Means of Verification:

Site plans showing voids and ventilation items,

Site facilities management plan showing ventilation modes.

Audit report on ventilation system's design and installation.

Guidance / implementation strategy:

Occupy the building with naturally ventilated spaces or mechanical ventilation. Design and implement the ventilation system according to local code requirements.

Additional information:

F HEALTH AND WELL BEING

F-04

Daylight

Number of

Credits
available:

1

Type of credit: 1

Mandatory

Optional

Background / aim:

To provide healthy and comfortable environment to building occupants.

Performance indicator:

Option 1 (rule of thumb method)

Provide transparent doors/windows at least 1/7 of space floor area for at least 80% of the occupied space.

Option 2 (calculation method)

Provide daylight factor for 80% of the spaces calculated according to requirements of Georgian construction code “Insolation and daylight”, effective in 1999-2004.

Means of Verification:

Option 1

Floor Plans, calculations

Option 2

Daylight factor calculation report for spaces, area calculations

Guidance / implementation strategy:

Maximize openings, plan the occupied spaces within 6 m. distance from building envelope windows/doors.

Additional information:

Spaces deeper than 6m. from the building envelope window can not be considered calculation of compliant space (except skylight day lit spaces) in rule of thumb method option.

F HEALTH AND WELL BEING			
F-05		VOC	
Number of Credits available:	1	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce negative impact on building occupants</p>			
<p>Performance indicator:</p> <p>Develop and implement low VOC (volatile organic compound) occupation plan for the site. The plan should contain as minimum the following: management of paints and adhesives, carpet, furniture, existing VOC risk management, phase out plan for VOC containing furniture (if any).</p>			
<p>Means of Verification:</p> <p>VOC management plan, implementation report, materials specifications and purchase documents, implementation report.</p>			
<p>Guidance / implementation strategy:</p>			

Specify paints, adhesives, carpets and furniture with no VOC content.

Additional information:

F HEALTH AND WELL BEING			
F-06		Storage of Chemicals and hazardous materials	
Number of Credits available:	1	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce negative impact on building occupants caused by chemicals</p>			
<p>Performance indicator:</p> <p>Develop and implement chemicals management plan within the building. The plan should contain as minimum the following: management of chemicals and other hazardous materials, storing, using and disposing, staff responsibilities, occupants' responsibilities.</p>			
<p>Means of Verification:</p> <p>Chemicals and hazardous materials management , implementation report implementation report.</p>			
<p>Guidance / implementation strategy:</p>			

Develop a plan to manage on-site chemicals and hazardous materials, such as printing toners, chemicals used in the processes.

Additional information:

This credit does not cover asbestos issue

F HEALTH AND WELL BEING

F-07

Asbestos risk management

Number of
Credits
available:

1

Type of credit:

Mandatory

Optional

Background / aim:

To reduce negative impact on building occupants caused by presence of Asbestos containing materials

Performance indicator:

Develop and implement asbestos risk management plan for the building.

The Plan must include, as minimum asbestos survey results, staff responsible for risk management, plan for removal works.

Means of Verification:

Asbestos management plan, asbestos survey report, report on asbestos works.

Guidance / implementation strategy:

Develop a plan to manage on-site presence of asbestos containing materials, apply professional expertise in management of the risk.

Additional information:

F HEALTH AND WELL BEING

F-08

Entrance Dust

Number of
Credits
available:

1

Type of credit:

Mandatory

Optional

Background / aim:

To reduce negative impact on building occupants caused by presence of dust particles in the air

Performance indicator:

Mat of at least 2.5 length in all building main entrances, excluding ones used only for emergency exit/s.

Means of Verification:

Site plans, photographs.

Guidance / implementation strategy:

Apply the mat at all building main entrances

Additional information:

H SITE MANAGEMENT			
H-01		Waste Management	
Number of Credits available:	I	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce negative environmental impact through proper management of the on-site generated waste; To support recycling of on-site generated waste</p>			
<p>Performance indicator:</p> <p>Requirement 1</p> <p>Bins for separate waste collection, as minimum for plastics, paper, steel, alluminum cans, glass.</p> <p>Requirement 2</p> <p>Waste management plan disseminated among occupants, occupants are trained in separate primary waste collection.</p>			
<p>Means of Verification:</p> <p>Photographs, occupants training report</p>			

Guidance / implementation strategy:

Apply waste bins and place in the central waste collection area, assure primary waste separation.
Approach waste collection companies able to reuse or recycle separated waste.

Additional information:

H SITE MANAGEMENT			
H-02		Occupiers training and user's guide	
Number of Credits available:	1	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To support sustainable building operation</p>			
<p>Performance indicator:</p> <p>Implementation of occupiers' training and education in sustainable facilities operation covering as minimum, the following issues: thermal management, ventilation, hazardous materials safety, tobacco smoke control, asbestos awareness.</p>			
<p>Means of Verification:</p> <p>Training plan and implementation report.</p>			
<p>Guidance / implementation strategy:</p>			

Conduct building occupiers education and training, covering issues of sustainable management.

Additional information:

H SITE MANAGEMENT			
H-03		Hazardous Waste Management	
Number of Credits available:	I	Type of credit:	Mandatory <u>Optional</u>
<p>Background / aim:</p> <p>To reduce negative environmental impact through proper management of the on-site generated hazardous waste; To support recycling of on-site generated hazardous waste.</p>			
<p>Performance indicator:</p> <p>Requirement 1</p> <p>Bins for separate collection of hazardous waste.</p> <p>Protected storage of hazardous waste bins.</p> <p>Requirement 2</p> <p>Hazardous waste management plan disseminated among occupants, and the occupants are trained how to identify and treat hazardous waste.</p>			
<p>Means of Verification:</p>			

Photographs, occupants training report

Guidance / implementation strategy:

Apply special bins for hazardous waste and place in safe and protected area, assure safe disposal of hazardous waste.

Additional information:

I OTHER ISSUES			
I-01		Other Issues	
Number of Credits available:	2	Type of credit:	Mandatory Optional
<p>Background / aim:</p> <p>To support alternative approaches in sustainable operation and maintenance of existing buildings.</p>			
<p>Performance indicator:</p> <p>Demonstrate other approaches, not listed in the rating system to support sustainable asset, its operation and maintenance.</p>			
<p>Means of Verification:</p> <p>Other documents reflecting alternative strategies and approaches, identified by the assessor.</p>			
<p>Guidance / implementation strategy:</p> <p>Apply worldwide good practice and innovations in operation and maintenance of the building.</p>			
<p>Additional information:</p>			

REFERENCES

LEED EBOM 2008, LEED EBOM 2009, www.usgbc.org

BREEAM In-use International Technical Manual, BRE Ltd 2015

San Diego Green Building Program

<http://www.sandiegocounty.gov/pds/greenbuildings.html>

Whole Building Design Guide, a Program of National Institute of Building Science

<http://www.wbdg.org/>

Rocky Mountain Institute

<http://www.rmi.org>