

**SI 5281 – SUSTAINABLE BUILDINGS:
PART 2 – REQUIREMENTS FOR RESIDENTIAL BUILD-
INGS**

Draft for review and comments

Revision Notice

This Standard replaces Israel Standard SI 5281, November 2005

Updating the Standard

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Draft

Introduction

This document is part of the SI 5281 – Sustainable Buildings series of Standards that set out the characteristics for certifying different types of buildings with a reduced environmental impact.

The Standards in the series are as follows:

- SI 5281 - Sustainable Buildings: Part 1 General Requirements
- SI 5281 - Sustainable Buildings: Part 2 - Requirements for residential buildings
- SI 5281 - Sustainable Buildings: Part 3 - Requirements for office buildings
- SI 5281 - Sustainable Buildings: Part 4 - Requirements for education buildings
- SI 5281 - Sustainable Buildings: Part 5 - Requirements for hotels
- SI 5281 - Sustainable Buildings: Part 6 - Requirements for healthcare buildings
- SI 5281 - Sustainable Buildings: Part 7 - Requirements for retail buildings
- SI 5281 - Sustainable Buildings: Part 8 - Requirements for public buildings
- SI 5281 - Sustainable Buildings: Part 9 - Requirements for industrial buildings⁽¹⁾
- SI 5281 - Sustainable Buildings: Part 10 - Requirements for neighbourhoods⁽¹⁾

This document should be read in conjunction with SI 5281 – Sustainable Buildings: Part 1 General Requirements which sets out the background to the Standards, assessment methodology and scoring process.

⁽¹⁾ In preparation

Scope

SI 5281 – Sustainable Buildings: Part 2 can be used to assess building types with residential accommodation. These include:

1. **Apartments**
2. **Boarding school's dormitories and student halls of residence**
3. **Care homes** (that do not contain extensive medical facilities)
4. **Sheltered housing**

The building functions listed below are included within the scope of this Standard where they form part of one of the above building types:

Function areas	Self contained dwellings Individual bedrooms Kitchen and catering areas - servery, dining café areas General communal areas - lounges, day rooms, reading rooms Offices - admin areas, IT rooms Meeting rooms - training rooms, conference rooms Leisure areas - gyms, fitness rooms, therapy rooms, hairdressers Health areas - consulting rooms, medical/first aid rooms, treatment rooms Laundry - communal laundry, drying rooms Other spaces - small internal shop/kiosk, workshop spaces
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The Standard only applies in buildings over 60m².

In mixed use settings this Standard will apply where over $\frac{2}{3}$ of the building is residential accommodation.

What cannot be assessed by SI 5281 – Sustainable Buildings: Part 2

- Hotels, bed and breakfast accommodation and youth hostels
- Temporary housing

Scoring

Once all the characteristics have been assessed and the totals for each section are known the scoring sheet below can be used to determine the overall score and subsequently the SII Sustainable Buildings rating.

Environmental weightings are applied to each score to enable the points to be added together to produce a single overall score.

How to complete the scoring sheet

1. Insert the number of points achieved for each section in column 2.
2. Calculate the percentage of points achieved for each section as follows and enter the results in column 3.
Points Achieved (column 2) / Points Available (column 1) and multiply by 100
3. Calculate the section score as follows for each section and enter the results in column 5.
% of Points Achieved (column 3) x Section Weighting (column 4)

Table 1: Buildings in which systems are integral part

SI 5281 Section		1 Points Avail- able	2 Points Achieved	3 % of Points Achieved	4 Environmental Weighting	5 Section Score
1. Energy	1.1 Performance	30			0.27	
	1.2 Systems	15			0.13	
2. Site					0.17	
3. Water					0.17	
4. Materials					0.06	
5. Health and Wellbeing					0.09	
6. Waste					0.04	
7. Transport					0.01	
8. Management					0.04	
9. Innovation					0.02	
Total Score						
SI 5281 Rating						

Table 2: Buildings in which systems are not integral part

SI 5281 Section		1 Points Avail- able	2 Points Achieved	3 % of Points Achieved	4 Environmental Weighting	5 Section Score
1. Energy	1.1 Performance	35			0.31	
	1.2 Systems	10			0.09	
2. Site					0.17	
3. Water					0.17	
4. Materials					0.06	
5. Health and Wellbeing					0.09	
6. Waste					0.04	
7. Transport					0.01	
8. Management					0.04	
9. Innovation					0.02	
Total Score						
SI 5281 Rating						

1. Energy

Table 3: Minimum Standards of Energy Scores of "Green Building" Label Rating

Characteristic	'Green Building' label rating				
	Green	Silver	Gold	Platinum	Diamond
1.1 Building Energy Performance	12	16	19	22	25
1.2 Building Services System	6	7	8	9	11
1.1.3 At least Level According to SI 5282-1	C	B	A	A+	A+

A Building would score this level of standard ('Green Building' label rating) only if it scored at least the points in the energy chapter.

Note:

In this chapter the maximum points awarded shall be 45 points.

However, it is possible to accumulate additional points and move them to chapter 9 according to the following:

Each extra 3 points will be equal 1 additional point in Chapter 9 (and up to the maximum points awarded for the relevant characteristic).

Characteristic	No. of points available	Minimum standard
1.1 Building Energy Performance		
Buildings in which the systems are an integral part מערכות משותפות כלל מבניות	30	Yes
Buildings in which the systems are not an integral part מערכות עצמאיות דירתיים	35	Yes

Characteristic	No. of points available	Minimum standard
1.1.1 Bioclimatic Design – Passive heating and cooling	4	Yes

Intent

To encourage energy efficient building design and passive heating and cooling techniques.

Assessment Criteria

Assessment Criteria	Points
<p>A Determining Design Strategy</p> <ul style="list-style-type: none"> Presentation of climatic conditions of the building location (temperature, and relative humidity) throughout the year on a Bioclimatic Chart with Design Strategies. According to the thermal comfort graph, determination of the environmental-climatic design strategy appropriate for the proposed project. Use of passive heating and cooling systems and ensuring natural ventilation in the building according to the environmental-climatic design strategy appropriate for the location. The passive systems to be applied in the project and the building area served by each system be presented in schematic drawings. 	0
<p>B Passive/ Hybrid systems</p> <ul style="list-style-type: none"> The points shall be determined according to the contribution of passive/hybrid systems applied. A passive/hybrid system that serves more than one strategy, shall be equivalent to the number of strategies that it serves. Each passive system must serve at least a portion of the floor area of the building devoted to the primary functions according to appendix A (in preparation) excluding passive solar direct gain, as detailed. <ul style="list-style-type: none"> 15% 30% 45% 60% If natural ventilation used, acoustic standards set out in 5.14 should be adhered to. 	0 1 2 3 4

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<ul style="list-style-type: none"> Report including design and schematic engineering drawings for each passive system showing the area that each passive system serves. Modelling results from approved software of baseline and proposed 	<p>Assessor's building/site inspection (or "as made" drawings) and photographic evidence confirming:</p> <ul style="list-style-type: none"> Installation of passive systems

conditions for each passive system according to C	
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Notes and References

Approved software and manually design tools:

Presentation of climatic conditions & determination of the environmental-climatic design strategy: WeatherTool (Ecotech), ClimateConsultant (Milne) ,Pasys (Yezioro & Shaviv) OR Using manual method by presenting the Psychometric Graph according to: ASHRAE, SHAPIRA, OLGAY, GIVONY, ARENS.

Appendix A: in preparation

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Characteristic	No. of points available	Minimum standard
1.1.2 Bioclimatic Design – Sun and shade	7	Yes

Intent

Maintaining the solar rights of the planned project and of the buildings and open areas in its close environment.

Assessment Criteria

Assessment Criteria	Points
A - Check of shading of the buildings and the neighbouring objects on each of the building sides, by means of shading graphs, sketches or electronic simulation, demonstrating the planned project's exposure to the sun to obtain the required exposure level during each season of the year according to appendix B..	0
B - Obtaining the exposure level required for the planned project of:	
B1- At least 50% of the roof area will be exposed to the sun on 21 December for at least four hours between 09:00 and 15:00. This will ensure exposure of Solar devices (photo-voltaic cells and solar collectors for water heating).	1
B2 Glazing systems required for passive heating.	1
B3 The main open area (according to appendix B).	1
B4 Fixed or Dynamic shading devices of 20% of the main open area according to: Fixed shading devices in areas which are shaded by building masses during the winter (where there is no obstruction of the solar rights of the building, or additional shading of the open area in winter). Dynamic shading devices in areas which are not shaded by building masses during the winter (where there is no obstruction of the solar rights of the building).	1
C - Check of shading, by means of shading graphs, sketches or electronic simulation, demonstrating that the planned building maintains the solar rights of the neighbouring buildings and the open spaces adjacent to the planned building (according to appendix B).	0
D - Attain the required exposure level in the neighbouring buildings of:	
D1 The solar devices (photo-voltaic cells and solar collectors) existing on the roof of the neighbouring buildings: These devices will be exposed to the sun on 21 December for at least four hours between 09:00 and 15:00 hours. Exposure to the sun shall be considered when at least 50 % of the roof areas of the neighbours is exposed to the sun	1
D2 Glazing systems required for passive heating (according to appendix B).	1
D3 The main open public area (according to appendix B). The test area shall include the plot limits and all the buildings and open areas bordering on the project plot. In addition, the area around the tallest building in the plot of a radius of twice its height shall be included.	1

- **This clause is mandatory:**
 - for buildings taller than 90m, or those taller than 45m where their length is greater than 45m.

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<ul style="list-style-type: none"> • Report including design and schematic engineering drawings for maximising sun exposure, shading strategies • Modelling results from approved software or manually design tools showing design complies with required sunlight exposure levels for both proposed buildings and neighbouring buildings 	Assessor's building/site inspection: Building has been built in accordance with design report: achieving acceptable shading levels and required sunlight exposure levels

Notes and References

Approved software and manually design tools: software (SHADING, SUSTRAC, ECOTECH), manually designed tools: according to appendix B.

Appendix B: Sun Rights In Urban Planning (Prof. Shaviv).

Characteristic	No. of points available	Minimum standard
1.1.3 Energy Efficiency according to SI 5282-1	25	Yes

Intent

Achieving savings in energy consumption required for passive heating and cooling the building.

Assessment Criteria

Compatibility with the energy consumption grades specified in Israel Standard SI 5282 Part 1 demonstrates compliance of the building structure as follows:

Compliance level	New building	Existing building
Level D		5
Level C	5	10
Level B	10	15
Level A	15	20
Level A+	20	25

Points**1.1.3.1 An extraordinary passive building:**

An extraordinary passive building demonstrates energy saving for climate conditioning by passive means, relative to reference building in SI 5282

and by using the Software ENERGY_Ui:

65% for climate zones A,B,C

55% for climate zone D

And at least one system should be presented for passive heating and one system for passive cooling in section 1.1.1, or enhanced natural ventilation for comfort according to 5.2.

<i>New Build</i>	<i>Renovation</i>
	In preparation in 5282 -1

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Copy of SI 5282 Part 1 output report by Accredited Energy Assessor, including marked up drawings and relevant specification clauses and the energy rate obtained.	<p>'As made' drawings and specification demonstrating:</p> <ul style="list-style-type: none"> Compliance with SI 5282 Part 1 <p>Assessor's building/site inspection and photographic evidence demonstrating:</p> <ul style="list-style-type: none"> Examples of the recommendations of compliance with SI 5282 Part 1 having been manifested in the actual complete building

Notes and References

SI 5282 Part 1 assesses energy consumption required for 'acclimatizing' according to 4 climatic zones:

Zone A – Coastal strip zone;

Zone B – Coastal plane and low country zone, the Negev (excluding the Negev Mount), the northern valleys and other locations;

Zone C – Mountain zone;

Zone D – Jordan valley and the desert zone.

Accredited energy assessor: An individual trained and qualified to carry out energy assessment who are members of an accredited scheme.

Draft

Characteristic	No. of points available	Minimum standard
1.1.4 Daylighting of public indoor areas	1	No

Intent

To reduce energy for electric lighting in lobbies, stairwells , etc

Assessment Criteria

The following demonstrates compliance:

- All public communal indoor spaces in daily use (excluding storage, emergency stairwells etc.) shall be daylit according to: min window area 3% of the floor area of these spaces.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new-build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Relevant design stage drawings clearly showing: <ul style="list-style-type: none"> Location of glazed areas Details of glazing system 	Assessor site inspection report and/or Photographic evidence confirming for each public space

Characteristic	No. of points available	Minimum standard
1.1.5 Drying Space	1	No

Intent

To provide a reduced energy means of drying clothes.

Assessment Criteria

The following demonstrates compliance:

All dwelling units should have a secure and *adequate* external space with posts and footings, or fixings capable of holding:

- 1-2 bedrooms: 4m+ of drying line
- 3+ bedrooms: 6m+ of drying line

Only in public areas like dormitories it may be an indoor space with adequate, controlled ventilation.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new-build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Relevant design stage drawings clearly showing: <ul style="list-style-type: none"> • Location of drying fixings • Details/location of ventilation provided (for internal spaces only) <p>AND</p> Text describing (on drawings or specification): <ul style="list-style-type: none"> • Location and type of internal or external drying fixings/footings or posts 	<p>EITHER</p> Copies of purchase orders/receipts of internal or external drying devices
	<p>OR</p> Assessor site inspection report and/or Photographic evidence confirming for each dwelling and/or bedroom with a different specification accompanied

Notes and References

Adequate internal space: Either an outdoor space, like balcony, or special space outside the building, or on the roof, OR only in public areas like dormitories it may be an indoor space with adequate, controlled ventilation. .

The fixing/fitting needs to be a permanent feature.

Characteristic	No. of points available	Minimum standard
1.2 Building services systems		
Buildings in which the systems are an integral part מערכות משותפות כלל מבניות	15	Yes
Buildings in which the systems are not an integral part מערכות עצמאיות דירתיים	10	Yes

Characteristic	No. of points available	Minimum standard
1.2.1 Energy Lighting Performance	4	No

Intent

Achieving savings in energy consumption required for lighting

Assessment Criteria

The following demonstrates compliance:

Assessment Criteria	Points
A. Energy Performance – Lighting (according to SI 8995) <u>Not assessed in this standard</u>	0
B. Lighting Fixture Above 70% reflectance 50% of the public areas	1 0.5
C. Controls for reducing energy consumption from lighting indoor Assessed in communal areas only On/off Occupancy sensors Central lighting management Lighting sensors according to 5282.	1
D. Lighting of communal areas (internal and external)	1
E. Controls for reducing energy consumption from lighting outdoor Light fittings are controlled through a time switch and occupancy sensor, or daylight sensor, to prevent operation during daylight hours. Daylight sensor override on a manually switched lighting circuit is acceptable Applies to non-communal and communal areas	1

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new-build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<ul style="list-style-type: none"> • Copy of specification and relevant clauses • Lighting designer's calculations • Marked up design drawing 	<ul style="list-style-type: none"> • Assessor site inspection report and/or as-made drawings • Photographic evidence

Notes and References

SI 8995

Characteristic	No. of points available	Minimum standard
1.2.2 Water Heating	5	Yes

Intent

Savings in energy required for heating water for consumption.

Assessment Criteria

The following demonstrates compliance:

A Solar Water Heating:

For all types of buildings that have **no** mandatory requirement and that use is made of a standard solar system in accordance with Israel Standard SI 579 (all parts).

Supply of hot water to the following percentage of the of the dwelling's water consumption

- 25%
- 50%
- 75%
- 100%

To receive points for this clause:

- a. It is mandatory to meet the solar exposure requirements of the solar
- b. devices of exposure to sun on 21st December for at least 4 hours between 09.00 and 15.00 hours.
- c. The distance between a collector and the point of use shall not exceed 35 meters.
- d. Hot waters pipes shall be insulated according to SI 579.

Other systems will be used only if the solar systems potential has been used fully.

B Local water heating system

Water heating with heat pumps

Water heating system using lpg

OR

C Central water heating

Not assessed in this standard

Points

1
2
3
4

1
0.5

0

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Marked-up design plan or specification confirming: <ul style="list-style-type: none"> • Proposed installation of solar water heating 	Assessor's building/site inspection (or "as made" drawings) and photographic evidence confirming: <ul style="list-style-type: none"> • Installation of solar water heating

Notes and References

To receive points for solar systems it is mandatory to meet the solar exposure requirements specified in item 1.2.2. B1.

Boilers efficiency according to SI 401 part 1 and part 2.

Draft

Characteristic	No. of points available	Minimum standard
1.2.3 On-site Renewable Energy	4	No

Intent

To encourage and recognize increasing levels of on-site renewable in supplying a significant proportion of the energy demand.

Assessment Criteria

The following demonstrates compliance:

(all systems installation **on the roof** will be accepted only if the potential of water heating has been used fully according to characteristic 1.2.2)

- | Assessment Criteria | Points |
|---|--------|
| A. Use of PV systems 4 per each dwelling unit. | 1 |
| B. Installation of wind turbines to generate 4 kW peak power per each dwelling unit. | 1 |
| C. Use of a thermal-solar air conditioning system of 6 kW thermal cooling power capacity | 1 |
| D. Ground source heat pumps with a COP ≥ 5 – serving A/C of at least 30% of the floor area of the primary function of the building | 1 |

To receive points for solar systems, it is mandatory to meet the solar exposure requirements specified in item 1.2.2.

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Marked-up design plan or specification confirming: <ul style="list-style-type: none"> Proposed renewable system Manufacturer's technical data and details or calculations stating the power output of the system.	Assessor's building/site inspection (or "as made" drawings) and photographic evidence confirming: <ul style="list-style-type: none"> Installation of renewable system

Notes and References

The priority is for solar water heating according to 16L/person/day, one would need 0.5 m per person per day for solar collectors.

Characteristic	No. of points available	Minimum standard
1.2.4. HVAC Systems	7	No

For AC systems points will be allocated if at least 50% of the building area will be served by systems with 1.2.4.1 or 1.2.4.2. or 1.2.4.3.

Characteristic	No. of points available	Minimum standard
1.2.4.1. Central Air Conditioning Systems	0	N/a

Not assessed in this Standard

Draft

Characteristic	No. of points available	Minimum standard
1.2.4.2. Mini-central Air Conditioning Systems (for apartment)	2	No

Intent

To ensure that centrally located cooling equipment is energy efficient in its operation.

Assessment Criteria

Applies to both non-communal and communal areas

Energy Efficiency: Criteria are awarded for air conditioning units in accordance with the following Energy Efficiency Class Ratings:

- Class C
- Class B
- Class A

0.5

1

2

Further credit(s) are available where variable speed drives are fitted to the compressors, pumps and fans, and where exposed refrigeration pipework is insulated and enclosed in protective trunking.

Controls: The climate conditioning system must be designed to allow *occupant control* of zoned areas within all individual apartments. Controls should adjust system operating set points in a manner that minimises the refrigeration system's energy consumption under different operating loads, weather conditions and surrounding air temperatures.

Installation and commissioning: to be undertaken by a competent approved engineer.

<i>New Build</i>	<i>Renovation</i>
<p>Efficiency: Energy Efficiency Class ratings shall be as under the Eurovent Certification scheme.</p> <p>Further credit(s) are awarded where more than 50% of the total combined peak electrical load of refrigeration compressors, fans and circulating pumps are controlled by variable speed drives and all exposed refrigeration pipework is insulated and enclosed in protective trunking to limit damage</p> <p>Controls: Controls must allow occupant control (setpoint or trim) within all zones within the building and at least three of the following features:</p> <ul style="list-style-type: none"> • Automatic regulation of chilled water (variable setpoint determined by demand and/or weather characteristics) • Variable flow control for primary and/or secondary circuits • Sequence control or variable speed control of chiller plant • Separate temperature control for secondary circuit(s) • Enthalpy control <p>Installation: The installation should be carried</p>	<p>There are no additional or different criteria to those outlined above specific to renovation projects</p>

<p>out by a competent refrigeration and air-conditioning engineer with a valid refrigerant-handling certificate and the installer should be approved by the manufacturer or supplier of the equipment.</p> <p>Commissioning: in accordance with the criteria for refrigeration equipment as set out in the Carbon Trust publication GPG347 <i>Installation and commissioning of refrigeration systems</i>.</p>	
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Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the relevant clauses of specification and/or marked-up M&E drawings confirming the energy rating, scope of the cooling controls, and requirements for commissioning.	User manuals or photographic evidence confirming the installation of user controls in each <i>occupied space</i> .

Notes and References

Separate Occupant Control: Heating/cooling controls for a particular area/zone of the building that can be accessed and operated by the individual(s) occupying that area/zone. Such controls will be located within, or within the vicinity of, the zone/area they control.

Controls standards

[UK Enhanced Capital Allowances scheme](#)

Efficiency standards

<http://www.eurovent-certification.com/>
([sample page](#))

Characteristic	No. of points available	Minimum standard
1.2.4.3 Single Air Conditioner	2	No

Intent

To ensure that small scale air conditioning units are energy efficient in their operation.

Assessment Criteria

Applies to both non-communal and communal areas

Energy Efficiency: Criteria are awarded for air conditioning units in accordance with the following Eurovent Energy Efficiency Class Ratings:

- Class C
- Class B
- Class A

Points

0.5

1

2

Further credit(s) is where automatic controls prevent simultaneous heating and cooling within the same space within the building, and where exposed refrigeration pipework is insulated and enclosed in protective trunking.

Installation and commissioning: to be undertaken by a competent approved engineer.

<i>New Build</i>	<i>Renovation</i>
<p>Efficiency: Energy Efficiency Class ratings shall be as under the Eurovent Certification scheme.</p> <p>Further credit(s) is awarded where where automatic controls prevent simultaneous heating and cooling within the same space (e.g. through interlocks) and all exposed refrigeration pipework is insulated and enclosed in protective trunking to limit damage</p> <p>Installation: The installation should be carried out by a competent refrigeration and air-conditioning engineer with a valid refrigerant-handling certificate and the installer should be approved by the manufacturer or supplier of the equipment.</p>	<p>There are no additional or different criteria to those outlined above specific to renovation projects.</p>

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A copy of the relevant clauses of specification and/or marked-up M&E drawings confirming the scope of the cooling controls.</p>	<p>User manuals or photographic evidence confirming the installation of user controls in representative <i>occupied spaces</i>.</p>

Notes and References

Efficiency standards

<http://www.eurovent-certification.com/> ([sample page](#))

Characteristic	No. of points available	Minimum standard
1.2.4.4 Central Heating System	2	No

Intent

To ensure that central heating systems are energy efficient in their operation.
Characteristic only relevant standalone heating system (not where air-conditioning can also provide heat).

Assessment Criteria**Points**

cop \geq 4

Or cop \geq 3 with heat recovery

Efficiency: Thermal efficiency no lower than that detailed in Israel Standard SI 1676

Domestic Hot Water: To be independent of heating circuit and supplemented by means of a solar system

Controls: The heating system must be designed to allow *occupant control* of zoned areas within individual apartments. Controls should adjust system operating set points in a manner that minimises the heating system's energy consumption under different operating loads, weather conditions and surrounding air temperatures.

Installation and commissioning: to be undertaken by a competent approved engineer.

<i>New Build</i>	<i>Renovation</i>
<p>Efficiency: Energy Efficiency Class ratings shall be as in SI 1676.</p> <p>Solar thermal systems shall provide a minimum of (TBD).</p> <p>Controls: Controls must allow occupant control (setpoint or trim) within all zones within the building and at least two of the following features:</p> <ul style="list-style-type: none"> • Automatic regulation of hot water (variable setpoint determined by demand and/or weather characteristics) • Variable flow rates for secondary circuits (to match heating demand) • Sequence control of heating plant (to match partial loads) • Separate time and temperature control for secondary circuit(s) <p>Installation and commissioning: shall be carried out by a competent engineer approved by the manufacturer or supplier of the equipment. Commissioning of central heating systems (covering boilers, pipework, pumps, controls, etc.) shall include setting to work, testing and adjustment and recording system settings/test results. It must be specific to the system and in accordance with the manufacturers' instructions.</p>	<p>There are no additional or different criteria to those outlined above specific to renovation projects</p>

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the relevant clauses of specification and/or marked-up M&E drawings confirming the scope of the cooling controls.	User manuals or photographic evidence confirming the installation of user controls in representative <i>occupied spaces</i> .

Notes and References

Thermal efficiency standards - SI 1676

Draft

Characteristic	No. of points available	Minimum standard
1.2.4.5 Heat and cold storage	1	No

Intent

Refrigerating water for air conditioning purposes

Characteristic needs writing- TBD, In preparation.

Assessment Criteria

A. Cold storage required for air conditioning in order to shift loads for peak time to low.
Not assessed in this Standard.

B. Heat storage – in case of using heat pumps for central heating.
 (this does not replace solar energy for water heating).
 Relevant for all building that use water heating for dwellings located under 35m from the roof and for backup only.

Points

0

1

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new-build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
TBD	TBD

Notes and References

TBD

Characteristic	No. of points available	Minimum standard
1.2.5 Sub-metering and control	2	No

Intent

To recognise and encourage the installation of energy sub-metering that facilitates the monitoring of in-use energy consumption.

Assessment Criteria

The following demonstrates compliance:

Separate *accessible energy sub-meters*, labeled with the end energy consuming use, are provided for the following systems (where present):

- a. HVAC
- b. Domestic Hot Water
- c. Lighting
- d. Small Power (lighting and small power can be on the same sub-meter where supplies are taken at each floor/department).
- h. Other major energy-consuming items where appropriate (see Notes and References).

Applicable to private and communal areas:

- A. 3 elements
 - B. More than 3 elements
 - C. Each end user is provided with sub-metering
- Not applicable to communal areas

Points

1
2
1

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new-build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Specification document or technical drawings confirming: <ul style="list-style-type: none"> • Energy-consuming systems and their rated outputs • Metering arrangements for each system, type and location of meter specified. 	Assessor's building/site inspection and photographic evidence confirming: <ul style="list-style-type: none"> • Location and labelling/function of the individual sub-meters or BMS.

Notes and References

Lighting & small power: It is acceptable, within a single floor, for lighting and small power to be combined for metering purposes, provided that sub-metering is provided for each floor.

Other major energy-consuming items: depending on the building type, might include, for example, plant used for swimming or hydrotherapy pools, kitchen plant, cold storage plant, laboratory plant, sterile services equipment, transportation systems (e.g. lifts & escalators) drama studios and theatres with large lighting rigs.

Accessible meters: energy meters must be located in an area that allows for easy access to facilitate regular monitoring and readings by the staff and facilities manager. Typically this will be the plant room, main distribution room or control room (where BMS is installed).

Characteristic	No. of points available	Minimum standard
1.2.6 BEMS, Building Energy Management System	1	No

Intent

To control, monitor and manage energy use in the internal environment

Assessment Criteria

The following demonstrates compliance:

Installation of BEMS, Building Energy Management System that includes the following features:

- Monitoring and Targeting: of utilities and waste minimisation
- Stand Alone Operation: permitting plant and controls to operate if operator's station fails
- Trend Logs: enabling operator to prepare logs at each controller
- Time Control: enabling/ disabling items of plant up to 4 times/day
- Sequence Control: automatically sequence of plant by monitoring load and matching plant to load
- Optimum Start/ Stop: programmes calculating optimal start and stop times for HVAC plant, based on occupancy, outside conditions
- Boiler Management: allows enabling/ disabling of command signal to boiler control
- Chiller Management: allows enabling/ disabling of command signal to boiler control
- Load Shedding: monitor's site's energy use, predicts max demand and automatically sheds load

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new-build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Specification document or technical drawings confirming: <ul style="list-style-type: none"> • BEMS system 	Assessor's building/site inspection and photographic evidence confirming: <ul style="list-style-type: none"> • BEMS.

Notes and References

Reference:

Specification 47, Building energy, management systems, Defense Estates, 2001

1.2.7 Internal transportation systems

Characteristic	No. of points available	Minimum standard
1.2.7.1 Lifts	1	No

Intent

To encourage the specification of energy-efficient transportation systems.

Assessment Criteria**Points**

The following demonstrates compliance:

- An analysis of transport demand and patterns for the building has been carried out by the design team to determine the optimum number and size of lifts and *counterbalancing ratio* on the basis of anticipated passenger demand. **AND**
- The energy consumption for at least two types of lift or lift strategy 'fit for purpose' has been estimated and the system with the lowest energy consumption specified.

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the relevant report or documentation detailing the analysis undertaken and findings/recommendations. A copy of the lift specification.	The evidence required at this stage is the same as that outlined at the design stage.

Notes and References**Relevant definitions**

Counterbalancing ratio: Lifts use a counterweight to balance the weight of the car plus a proportion of the maximum weight of the passengers; this reduces the size of the drive motor required for the lift. Lowering the counterbalancing ratio means a smaller motor and controlling drive unit are required, thus saving energy.

prEN ISO 25745-1 Energy performance of lifts, escalators and moving walks – Part 1 Energy and conformance

It has been estimated that between 5-15% of a building's total energy consumption can be attributed to the operation of lifts and 58% of the energy consumption of lifts is attributable to stand-by mode.

Characteristic	No. of points available	Minimum standard
1.2.7.2 Escalators and travelling walkways	0	N/a

Not assessed in this Standard

Draft

Characteristic	No. of points available	Minimum standard
1.2.8 Energy Efficient Fume Cupboards	0	N/a

Not assessed in this Standard

Draft

Characteristic	No. of points available	Minimum standard
1.2.9 Energy Efficient IT Solutions	0	N/a

Not assessed in this Standard

Draft

2. Site

Characteristic	No. of points available	Minimum standard
2.1 Site Selection	4.7	Yes

Intent

To encourage the use of land that has been previously developed within an existing built environment and discourage the use of undeveloped land for building, development and infrastructure.

Assessment Criteria

Points are awarded based on demonstration of the following:

Assessment Criteria	Points
a) compliance with National Master Plan on Building, Development and Conservation (NOP 35)	0
b) development has been planned according to a valid local master plan, detailed plan or building permit	0
c) development is located within an existing built up area	2.7
d) development is located within a 'Brownfield' site	1.1
e) development is located within an economically and socially deprived built environment	0.9

<i>New Build</i>	<i>Renovation / Fit-out</i>
There are no additional or different criteria to those outlined above specific to new build projects.	<p><i>Renovation</i> In the case of renovation, the credit can be awarded by default where no new building work or infrastructure is being constructed as part of the renovation.</p> <p><i>Fit-out</i> This characteristic is not assessed in a fit-out project.</p>

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>Existing site plan, report or site photographs confirming:</p> <ul style="list-style-type: none"> • Master plan (local / regional / national) • Type, duration and status of previous land use • Identification of aspects deemed for preservation • Economic and social status of the locale <p>Proposed site plan showing:</p> <ul style="list-style-type: none"> • Location and footprint of proposed development and temporary works. 	<p>Assessor's building/site inspection or as built drawings confirming:</p> <ul style="list-style-type: none"> • The location and footprint of the developed area has not altered from that proposed in <i>Stage A- Building Design</i>.

Notes and References

Redevelopment of land previously built on will help reduce the pressure to build on undeveloped sites and greenfield land, and can also bring much needed investment and regeneration

to abandoned sites, dilapidated sites and/or locations that have deteriorated socially and economically.

Reference should be made to the Central Bureau of Statistics definition of social-economic 'Eshkol' 1-4 with regards to economically and socially deprived built environments.

Brownfield - abandoned, idle or underutilised properties where expansion or redevelopment is substantially affected by real or perceived environmental hazards, building deterioration/obsolescence, and/or inadequate infrastructure.

Draft

Characteristic	No. of points available	Minimum standard
2.2 Contaminated Land	1.3	No

Intent

To encourage the rehabilitation of contaminated land, thus reducing the pressure on undeveloped land for building, development and infrastructure.

Assessment Criteria

The following demonstrates compliance:

Assessment Criteria	Points
<p>1. <i>Survey</i>: Provide a report, compiled by a suitably qualified specialist, including and identifying:</p> <ul style="list-style-type: none"> • Instructions/intent regarding identification and treatment of contaminated soils • The degree of contamination • The contaminant sources/types and status (assessment whether future contamination is still a risk) • The options for remediating sources of pollution which present an unacceptable risk to the site. 	0.6 (points will be awarded only in case survey is not required in local master plan)
<p>2. <i>Remediation</i>: Confirmation that remediation of the site has been carried out in accordance with the remediation strategy and its implementation plan. Approval by the relevant authorities that the work is completed and approved.</p>	0.35 (points will be awarded only in case remediation is not required in local master plan)
<p>3. <i>Monitoring</i>: Confirmation that a suitably qualified specialist will undertake regular site investigations after building handover, AND install a relevant system to monitor the presence of contaminants on a regular basis as coordinated with the relevant authority.</p>	0.35

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A copy of the specialist's land contamination report confirming:</p> <ul style="list-style-type: none"> • Degree, type and sources of contamination • Relevant pollution linkages • The options for re-mediating the site including schedules <p>Existing site plan(s) showing:</p> <ul style="list-style-type: none"> • Location of areas contaminated and to be remediated in relation to any proposed development <p>A letter from the main contractor or remedia-</p>	<p>A copy of the summary report confirming:</p> <ul style="list-style-type: none"> • Description of remedial works undertaken • Description of how the relevant pollution linkages have been addressed <p>A copy of</p> <ul style="list-style-type: none"> • Authorisation from relevant authority of remedial works completed • The commitment or contract confirming that site investigations will take place after building handover in coordination with the relevant authority

tion contractor confirming: <ul style="list-style-type: none">• The letter of appointment of specialist• The remediation strategy for the site• Summary details of the implementation plan.	
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Notes and References

Remediation of contaminated land is considered to be a positive action, freeing up land for redevelopment with the advantages of reducing the pressure on greenfield sites and bringing much needed investment and regeneration to abandoned sites or those previously used by another industry.

Contaminant – is defined as a solid, liquid or gaseous material in, or on the ground to be covered by the building, which is classed as a hazard and therefore presents an unacceptable risk to human health and the environment.

In this standard, the list of contaminants will be according to the regulations of the Ministry of Environmental Protection.

Remediation – activity undertaken to prevent, minimise, remedy or mitigate the risk caused by contaminated land to human health or the environment.

Draft

Characteristic	No. of points available	Minimum standard
2.3 Density for Building and Development	4.4	No

Intent

To encourage the selection of a design with a density that makes the best use of available land for development, thus reducing the pressure to develop open land.

Assessment Criteria

For sites within a plan approved according to valid local master plan prior to NOP 35

Demonstrate that the density of the development is equal or over the average density of the valid detailed local plan prior to NOP 35.

4.4

OR

For sites within a plan approved after and according to NOP 35

1. demonstrate that the density of the development is greater than the minimum density requirements as set out in the National Master Plan on Building, Development and Conservation (NOP 35)

2.2

2. demonstrate that the density of the development equals the maximum density requirements as set out in the National Master Plan on Building, Development and Conservation (NOP 35)

4.4

General Note - the density parameter refers to the density of a residential land-use according to NOP 35. The density of land-uses and/or mixed uses other than residential, should be a calculated using a conversion factor relative to residential density. A conversion factor of *100 sqm built area = 1 residential unit* is recommended. This conversion factor can be changed by the relative committee's land-uses other than residential.

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to new build projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the site plan, design, permit and calculations showing the number of units per net dunam within the plot area.	Assessor's building/site inspection confirming the number of units per net dunam within the plot area was implemented with no change after initial approval.

Notes and References

To make the best use of the available land for building and development. The importance of this characteristic is further emphasised due to the current growth patterns, which will require an increasing amount of land to be developed. The higher the density employed in land uses, the lower the negative impact on open land and ecology will be.

National Master Plan on Building, Development and Conservation (NOP 35) – sets out national policy for land use and development in Israel in order to minimise urban sprawl and distinguishes between different regions and their development patterns: natural, rural and areas with a potential for intensive and high quality urban development. NOP 35 sets criteria for density for different types of regions and cities (number of units per net dunam).

Detailed Local Plan - local plans set out the specifications and building rights associated with a specific plot/specific group of plots.

Characteristic	No. of points available	Minimum standard
2.4 Heat Island Effect	2.2	No

Intent

To apply mitigation strategies in order to reduce the heat island effect caused by the built and developed environment according to the climatic regions (as defined in SI 1045)

Assessment Criteria	Points
<p>A. Building Demonstrate the use of strategies, materials and techniques that reduce heat absorption for at least:</p> <ul style="list-style-type: none"> • 50% of total building's envelope • 75% of total building's envelope <p>AND</p> <p>B. Development Demonstrate the use of strategies, materials and techniques that reduce heat absorption for at least:</p> <ul style="list-style-type: none"> • 50% of total plot surface outside the building's footprint • 75% of total plot surface outside the building's footprint 	<p>0.9 1.3</p> <p>0.6 0.9</p>

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p><i>Building</i> Marked-up site plan and elevations highlighting:</p> <ul style="list-style-type: none"> • Total area of building envelope • Total area covered by any combination of the mitigation strategies • Calculation of percentage according to building's envelope components <ul style="list-style-type: none"> a. Specifications and/or documentation that demonstrate the selected materials have absorption coefficient of $\alpha \leq 0.35$ (bright colour) for roofs and absorption coefficient of $0.35 \leq \alpha \leq 0.55$ (moderate colour) for vertical surfaces. <p>•</p> <p><i>Development</i> Marked-up site plan highlighting:</p> <ul style="list-style-type: none"> • Total area of site development area • Total site area covered by any combination of the mitigation strategies • Calculation of percentage • Specifications and/or documentation that demonstrate the selected materials have absorption coefficient of 	<p><i>Building</i> Assessor's building inspection and photographic evidence confirming:</p> <ul style="list-style-type: none"> • That mitigation strategies have been employed per the percentage included in the design • Copies of documents confirming selected materials and their installation are as planned. <p><i>Development</i> Assessor's building inspection and photographic evidence confirming:</p> <ul style="list-style-type: none"> • That mitigation strategies have been employed • Copies of documents confirming selected materials have been installed as planned.

$0.35 \leq \alpha \leq 0.55$ (moderate colour) and that there will be no glare towards any user.	
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Notes and References

Heat island effect - a heat island is best visualised as a dome of stagnant warm air over the built-up areas of cities. The heat that is absorbed during the day by the buildings, roads and other development in an urban area is re-emitted after sunset, creating high temperature differences between urban and open/rural areas. In addition, use of materials that absorb heat during the day also seriously impact the electricity demand for increased air-conditioning in buildings during the summer months, increase smog production, detract from the wellbeing of residents outdoors, as well as contribute to increased emission of pollutants from power plants.

A buildings envelope's impact on heat island effect is assessed according to the following ratio:

Roof and horizontal surfaces: 60%

All vertical surfaces (southern and/or eastern and/or western and/or northern orientation): 40%

Strategies to reduce heat absorption

Strategies for roofs: Materials and techniques that could be employed include:

- a. Use of roofing materials with an absorption coefficient of $\alpha \leq 0.35$ (bright colour- "high albedo")
- b. Shade structures such as pergolas or canopies with photovoltaic panels, vegetated coverings and/or surfaces with absorption coefficient of $0.35 \leq \alpha \leq 0.55$ - moderate colour).
- c. Installing a combination of high-albedo surfaces, vegetated roof surfaces and shade structures as described above.

Strategies for vertical surfaces of a building envelope: Materials and techniques that could be employed include:

- a. Use of materials with absorption coefficient of $0.35 \leq \alpha \leq 0.55$ (moderate colour)

Development strategies (outside the building envelope): Materials and techniques that could be employed include:

- d. Providing shade from the existing tree canopy or substantial shade canopy from design shade tree plantings within 5 years of landscape installation
- e. Shade structures for common use or parking (such as pergolas or canopies with photovoltaic panels, vegetated roofs and/or surfaces with absorption coefficient of $0.35 \leq \alpha \leq 0.55$ - moderate colour).
- f. Paving materials with absorption coefficient of $0.35 \leq \alpha \leq 0.55$ (moderate colour) to increase reflection and to protect from glare at driver and pedestrian level. Use of a rough/granulated surface texture is also recommended together with the absorption coefficient.
- g. Coatings and integral colourants for asphalt to achieve lighter-coloured surfaces with absorption coefficient of $0.35 \leq \alpha \leq 0.55$ (moderate colour)
- h. Planted areas and/or use of open-grid pavement systems (with at least 60% planted area e.g. concrete-grass lattice) where water consumption is minimized. Solutions for reducing irrigation requirements can include use of natural/local plants species, use of drought resistant plant species, using recycled air conditioner condensation water, by increasing water retention qualities of the planting base, etc.

Characteristic	No. of points available	Minimum standard
2.5 Maximising the Usages of Built Space	2.3	No

Intent

To include the maximum built usages within the borders of the buildings' footprint and maximize the usages of open spaces to promote sustainability (vegetation, shade trees, runoff retention and infiltration, amenities for common use etc.)

Assessment Criteria

The design of the development demonstrates that the amount of open space for landscaping and amenity areas has been maximised by locating associated services such as car parking, waste storage and building services either underground or within the building, and developing roof areas as amenity areas, as follows:

Maximizing built usages within the borders of the buildings' footprint

- up to 50%
- up to 80%
- up to 100%

AND

Maximizing the usages of open space

Points

0.5

1

1.5

0.8

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	This characteristic is not assessed within a renovation project.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the site plan/design showing the location of associated services and calculations demonstrating the ratio of building footprint to open space. A copy of the landscape architecture plan demonstrating the location of vegetation, shade trees, runoff retention and infiltration, amenities for common use etc.	Assessor's building/site inspection confirming the location of associated services and that the values used to calculate the ratio are correct

Notes and References

It is important to strike a balance between the sustainability benefits of higher densities and the need to ensure good access to quality public open space for residents, workers and visitors.

Open space should:

- Be accessible to all potential building users, including those in wheelchairs
- Provide a space that is private or semi-private and not susceptible to disturbance from noise
- Provide appropriate seating and areas for socialising

Strategies for roofs:

Installing a vegetated roof: Water consumption used for vegetated roof irrigation should be minimized. Solutions for reducing irrigation requirements can include use of natural/local plants species, use of drought resistant plant species, using recycled air conditioner condensation water, by increasing water retention qualities of the planting base, etc. Water used for the vegetated roof will be calculated as part of landscape irrigation in Chapter 3.

Characteristic	No. of points available	Minimum standard
2.6 Conservation of Local Fertile Soil/Top Soil for use on Site	1.1	No

Intent

To encourage the conservation of soil on the whole plot area to a minimum depth of 40cm.

Assessment Criteria

Demonstrate that soil is either conserved on site or returned to site post construction to a depth of at least 40 cm on the site's vegetated areas.

Where the soil has been determined to be contaminated this characteristic can not be assessed.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	A renovation of a building, with no new construction, must conserve the existing soil on the site's vegetated areas. Conservation measures include clear exclusion procedures for construction traffic/personnel and material storage, as well as physical barriers.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A copy of the site plan/design showing where soil will be stored on site during the construction process (if applicable).</p> <p>A copy of the site plan/design and specifications showing the vegetated areas and confirmation that the soil will be restored to a depth of more than 40 cm.</p> <p>A copy of specifications/documents confirming that origin of the soil if it is being brought onto site from elsewhere.</p>	<p>Assessor's building/site inspection confirming depth of soil on the vegetated areas.</p> <p>Contractors receipts/documents confirming origin of soil if brought from elsewhere.</p>

Notes and References

The depth of soil on a site directly affects the ability to grow plants. Shallow soil is often not sufficient for substantial plantings and particularly limits planting when above structures such as underground parking. By increasing the depth of soil it is possible to encourage greater planting which has benefits in terms of promoting biodiversity and occupant's health and well-being. Wherever possible soil should be conserved on site rather than removed in order to protect the nature and topography of the site.

Characteristic	No. of points available	Minimum standard
2.7 Ecology of the Site	2.2	Yes

Intent

To identify and mitigate the existing ecology of the site from damage during site preparation and construction works and to encourage actions and solutions that will maintain and/or enhance the ecological value of the site as a result of development and during its operation.

Assessment Criteria

The assessment criteria applies in the following situations/cases:

- a. where preparatory earth works have been undertaken and infrastructure already exists on the site as part of a general development plan
- b. the site has not been pre-developed

1. *Identification of the Ecology of the Site and its Vicinity (relevant in case a and b)*

Provision of evidence compiled by a suitably qualified ecologist documenting the existing ecology of the site including features of ecological value, (mature trees, local plants, insect and animal life, etc), and assessment of the sites importance in context of the overall ecology of the region.

AND

Identification of ecological features in the vicinity of the site that rely on resources from the site to sustain themselves (for example run-off, earth for expansive root system, etc.)

To be issued as a summary report including assessment of the development on the ecology of the site and its immediate surroundings and recommendations.

2. *Protection of existing ecological features of the site and its vicinity (relevant only in case b)*

Demonstrate that all features of ecological value identified in the above report within the plot boundary and it's vicinity are adequately protected from damage during clearance, site preparation and construction activities, as listed below:

- Existing trees are protected by barriers.
- In all cases trees must be protected from direct impact and from severance or asphyxiation of the roots and they have adequate water for continued sustenance and development.
- Hedges /natural areas, etc requiring protection have barriers erected and are protected.
- Watercourses and wetland areas are protected by cut-off ditches and site drainage to prevent polluted run-off into natural watercourses (prevent pollution, silting, erosion, etc).
- Avoiding clearance/works at key times of the year (e.g. breeding seasons)
- Transfer of animals to a nearby alternative site where they can adapt themselves

AND

Demonstrate that the ecological features of the site and its vicinity are incorporated in the design and development in such a way that their habitat and ecological value are maintained and sustained in an appropriate and sustainable manner.

Points

0

1.1

3. *Enhancing Site Ecology (relevant in case a and b)*

Where evidence is provided by a suitably qualified ecologist that has been appointed, presenting the concepts and design principles regarding the enhancement of the ecology of the site in context with the development

1.1

AND

Demonstrate that the measures and solutions to be implemented will enhance the ecological value of the site including short term and long term goals for continued survival.

Recommendations may include:

- preparation of appropriate habitats using site resources for continued survival (soil , soil depth, runoff, space for achieving mature growth, etc)
- Planting of native species or those with a known attraction or beneficial to local wildlife.
- Adoption of horticultural good practice (e.g. no or low use of residual pesticides)
- Installation of bird, bat and/or insect boxes at appropriate locations on the site
- Development of a full Biodiversity Management Plan including avoiding clearance/works at key times of the year (e.g. breeding seasons)
- Integration, design and maintenance of SUDs and Green Roofs, community orchards etc.

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to new build projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p><i>Treatment of all Mature Trees</i> A copy of the approval from the relevant authority that all mature trees have been identified and that their treatment is approved.</p> <p><i>Protecting the Ecology of the Site and its Vicinity</i> A copy of the ecologists report containing details of any existing features of ecological value on the site and its vicinity. AND A copy of the appropriate section of the contractors specification confirming all features of ecological value will be protected and the type of measures to be used.</p> <p><i>Enhancing Site Ecology</i> A copy of the ecologists report containing recommendations for enhancing ecological value. AND A copy of the proposed site plan highlighting implementation of the ecologist enhancements recommendations. AND A copy of the appropriate section of the con-</p>	<p><i>Protecting the Ecology of the Site</i> Assessor's building/site inspection confirming that all features of ecological value are protected and will be incorporated as part of the site development.</p> <p><i>Enhancing Site Ecology</i> Assessor's building/site inspection confirming that the ecologist's recommendations have been implemented.</p>

tractor's specification confirming all recommendations will be implemented.	
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Notes and References

Very often development is seen as being detrimental to the ecological value of a site. In some cases this is true; however enhancement can also take place, which will require careful consideration of the existing and neighbouring features in addition to careful selection of plant species and habitats. Where damage as a result of construction is unavoidable measures can be taken to offset the effects by enhancing other areas of the landscape within the site.

A suitably qualified ecologist is an individual who holds a degree or equivalent qualification in ecology or a related subject and is a practising ecologist with a minimum of three years relevant experience.

Barriers - must prohibit construction works in the area between itself and the tree trunk. Minimum distance between tree trunk and barriers must be either the distance of branch spread or half tree height, whichever is greater.

Draft

Characteristic	No. of points available	Minimum standard
2.8 Joint use of Facilities	0	N/a

Not assessed in this Standard

Draft

3. Water

A Building would score at least 9 points in 3 or more sub chapters.

Characteristic	No. of points available	Minimum standard
3.1 Reduction of Potable Water Use Within the Building	6	Yes

Intent

To reduce the consumption of potable water within the building by encouraging the use of low water use fittings

Assessment Criteria

Demonstrate the use of low water use fittings that in aggregate reduce the amount of potable water consumed within the building in comparison to a baseline figure, by:

- 20%
- 25%
- 35%
- 40%

Points

0
3
4
6

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the calculations that: <ul style="list-style-type: none"> • demonstrate the estimated water use of the building • how the reduction in water consumption has been achieved including specifications of the low water use fittings proposed 	Manufacturer's/installer's details for installed fittings confirming their technical specification.

Notes and References

Preservation of Israel's water resources is one of the major challenges confronting the country today. Israel entered the 21st century with one of its greatest water overdrafts ever. To continue to supply the population with its water needs, under conditions of water scarcity, sustainable water management policies are being introduced including water conservation. Within buildings we can conserve water by reducing the amount required, especially for sanitary fittings which represent a significant proportion of the total water required.

This characteristic does not include water used for other purposes within the plot boundary such as landscaping and irrigation.

Low water use fittings that could be considered include:

- low and dual-flush toilets
- taps with flow regulators, aerator or spray inserts
- shower heads with flow regulators.

Baseline figure – this is set out within the Guidelines for Sanitary Installations (GSI).

Installation should take place in accordance with SI 6147 and SI 6148 (in preparation).

Characteristic	No. of points available	Minimum standard
3.2 Controls and Sub-metering	3	No

Intent

To reduce the impact of major water leaks that may otherwise go undetected.

Assessment Criteria

- a) Install a leak detection system capable of detecting major leaks on the water supply or over use and give an alert. The system should cover all mains water supply between and within the building and site boundary.

The leak detection system should be:

- Audible when activated
- Activated when the flow of water passes through the water meter/data logger at a flow rate above a pre-set maximum for a pre-set period of time
- Able to identify different flow and therefore leakage rates e.g. continuous, high and/or low level, over set time periods
- Programmable to suit the owner/occupiers' water consumption criteria
- Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.

OR

- b) Installation of a differentiated water meter for landscaping with a watering sub-meter.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A copy of the specification clause confirming the scope and performance criteria of the leak detection system. AND/OR Manufacturer's details confirming the technical specification of the specified system.</p> <p>A copy of the specification clause confirming:</p> <ul style="list-style-type: none"> • The specification of shut-off valves • The controls for the shut-off valves <p>A design plan showing: The location of the toilet facilities</p>	<p>Assessor's building/site inspection and photographic evidence confirming:</p> <ul style="list-style-type: none"> • The installation and operation of the leak detection system. • Pre-set variable of the system for triggering the alarm and the flexibility of the building occupier to vary these. <p>Assessor's building/site inspection and photographic evidence confirming:</p> <ul style="list-style-type: none"> • The location and installation of proximity detection controls. <p>AND 'as made' drawings showing:</p> <ul style="list-style-type: none"> • The specification of shut-off valves

Notes and References

Water leaks, either on the development or in the building itself, can result in significant losses and costs, and have the potential to cause major damage. Buildings present a significant risk of undetected leaks as toilet accommodation is often unoccupied for long periods outside the hours of operation.

Where this is a water authority meter at the site/building boundary, it may be necessary to install a separate flow meter to detect leaks; however, if the water authority agrees to some form of leak detection being installed on their meter, this would also be acceptable.

Draft

Characteristic	No. of points available	Minimum standard
3.3 Reduction of Potable Water Use for Landscaping	3	No

Intent

To reduce the consumption of potable water within the plot boundary for purposes other than within the building.

Assessment Criteria

Demonstrate the use of measures that in aggregate will reduce the amount of potable water consumed within the plot boundary for purposes other than within the building in comparison to a baseline figure, by:

- 10%
- 30%
- 50%
- 100%

The reduction of potable water use for landscaping can be achieved through a combination of the following measures:

a) planting drought resistant plant species

b) recycled air conditioner condensation water (installation of a collection system for recycled A/C water as per the notes below)

Drainage shall be according to NOP 34/B/4 and coordinated with the National drainage authorities.

Points

0
1
2
3

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A copy of the calculations that demonstrate how the reduction in water consumption has been achieved.</p> <p>Marked up drawings and specification detailing the infrastructure that will be installed. It should also confirm how the infrastructure (collection and treatment systems) have been appropriately sized to meet the needs of the building</p>	<p>Manufacturer's/installer's details confirming technical specification of installed irrigation features, wastewater treatment and plant species used.</p>

Notes and References

Preservation of Israel's water resources is one of the major challenges confronting the country today. Israel entered the 21st century with one of its greatest water overdrafts ever. To continue to supply the population with its water needs, under conditions of water scarcity, sustainable water management policies are being introduced including water conservation. Within the landscape we can conserve water by reducing the amount required, by adopting water efficient irrigation methods.

Water use within the plot boundary, other than within the building, can include purposes such as landscaping, irrigation and garden maintenance.

Measures for reusing condensation water from air conditioners for landscaping irrigation purposes could include:

- Direct irrigation from the condensation water collection line
- Use of a collection tank into which mains water is added to make up for the deficiency (with an air gap) and an overflow line to the sewage system in case of failure. The system shall be the sole supplier of water to a specific plot (without the presence of direct irrigation systems from the mains line to the same plot). Irrigation shall be by emitters only.

The recommended water values for landscaping purposes per m2 according to each climatic zone – TBD.

Draft

Characteristic	No. of points available	Minimum standard
3.4 Use of Greywater	0	N/a

Not assessed in this Standard

Draft

Characteristic	No. of points available	Minimum standard
3.5 Rainwater, Drainage and Stormwater Management	6	No

Intent

To promote the infiltration and drainage of rainwater into the aquifer

Assessment Criteria

Demonstrate that the proposed development will improve the existing natural drainage systems or provide an alternative for drainage for a runoff period of 5 years.

Percentage of rain water falling on the plot to be managed (by application to the ground) as follows:

- 15%
- 25%
- 50%
- 100%

Points

2
3
4
6

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	This characteristic is not assessed within a renovation project. In the case of renovation, the credit can be awarded by default where no new building work or infrastructure is being constructed as part of the renovation.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of site plans and calculations indicating: <ul style="list-style-type: none"> • the un-built area of the site • soil characteristics • rainfall • runoff rates • infiltration rates 	Assessor's building/site investigation and photographic evidence confirming: <ul style="list-style-type: none"> • installation of runoff attenuation measures that meet the 5 year storage period A letter from the contractor confirming that no changes have taken place since Stage A.

Notes and References

The maximum runoff values for return periods of five years will be according to the Israeli Meteorological Service.

Design and building Guidelines for stormwater management from Oct.2004 issued by the Ministry of Housing and Construction and the Ministry of Agriculture and Rural Development.

4. Materials

General note:

The material or product in this section is defined according to the state in which it arrives at the site, e.g. blocks, sack of material, etc.

Characteristic	No. of points available	Minimum standard
4.1 Specification of Green Label Materials and Products	5	Yes

Intent

To encourage specification of materials with Green Label or equivalent approved label for low environmental impact from material extraction, production and installation.

Assessment Criteria

Demonstrate the proportion of total area of products with the Israeli Green Label, or an equivalent label in building elements including but not limited to:

- External walls including insulation and wall covering/finishing materials
- Windows and doors
- Roof
- Floors
- Internal walls including insulation and wall covering/finishing materials
- Floor finishes/coverings

In order to achieve points, must use at least 3 from 6 elements.
Points are awarded based on the thresholds shown below.

Assessment Criteria	Points
≥10%	0
>25%	1
>40%	2
>55%	3
>70%	4
>85%	5

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	In refurbishment or fit-out projects, where existing elements (e.g. external walls) are retained, allow actual area of in-situ materials in the calculations.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Design drawings or specification detailing: <ul style="list-style-type: none"> • Area (m²) of each element. • A detailed material specification of each element identifying products with Green labels or equivalent. If applicable provide copies of manufacturer's literature to confirm the certification status of products. A copy of the calculations demonstrating the proportion of Green Labelled or equivalent rated building elements in the actual area of the elements.	Assessor's building/site inspection and photographic evidence confirming: Element in-situ (where possible) 'As built' building specification and, where relevant, written design team confirmation of any changes to materials specification. A copy of the calculations demonstrating the percentage of Green Labelled or equivalent rated building elements with respect to the actual area of the elements.

Notes and References

Green Label - a Green Label for products that have a reduced environmental impact was introduced by SII in December 1993. The Green Label program is based on Israeli standards SI 14020 and SI 14025, which are respectively equal to ISO 14020 and ISO 14025, which incorporates a long list of attributes that reduce a product's negative impact on the environment, without harming the product's reliability, function and quality.

Draft

Characteristic	No. of points available	Minimum standard
4.2 Recycled Materials	3	No

Intent

To reduce demand for virgin construction materials by using materials and products with recycled content and/or reused components.

Assessment Criteria

Demonstrate that recycled content account for 25% (by weight or volume) of the total amount of all construction materials used in the project.

The calculation shall include:

- Reused or refurbished materials (e.g. reused cinderblocks);
- Recycled aggregates used for high-grade aggregate uses which are sourced from project site, demolition sites or waste processing plants within in Israel
- Recycled material is a material that complies with ISO 14021 — Environmental labels and declarations — Self-declared environmental claims (Type II environmental labeling) or manufactured in a factory that is approved by the ministry of environmental protection.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	For the assessment purpose, in minor refurbishments and fit-outs where only internal elements such as floor finishes, partitions and paint are upgraded consider only those items in calculations.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A letter of intent from the design team or contractor confirming the following:</p> <ul style="list-style-type: none"> • Percentage constitution, in weight or volume, of recycled materials to the total amount of construction materials. • The source of recycled/secondary aggregates and the amount of aggregate that can be obtained from this source, if available. <p>An outline Bill of Quantity (BoQ) clearly identifying the quantity full or part recycled products specified, including recycled and secondary aggregate specified for high-grade purpose.</p> <p>A copy of product technical specification information, confirming the recycled content in a specific product. Provide suitable evidence to confirm the product declaration is compliant with ISO 14021.</p>	<p>A copy of 'As built' specification listing the products specified with full and part recycled content.</p> <p>A copy of final Bill of Quantity (BoQ) clearly identifying the quantity full or part recycled products specified, including recycled and secondary aggregate specified for high-grade purpose.</p> <p>Where new products specified, provide</p> <ul style="list-style-type: none"> • a copy of technical specification of the new product confirming the recycled content, • volume of material specified • Product declaration from the manufacturer.

Notes and References

Reference SI 1886 'Subbases and selected fill materials for highways, aprons and airfields': Manufacturing and transportation of aggregate platform or/and selected material for use in roads, paths, walkways and paved surfaces. This applies to: asphalt-based or similar road

surfaces; sub bases building foundations; and asphalt parking lots.

Recycled content - 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).

Products with part recycled content - For products with pre-consumer by-product source (e.g. Coal fly ash) the recycled content value of a product is determined by calculating the percentage constitution of recycled content in the total weight or volume of the product.

Recyclable products - If a specified product is recyclable at the end of its useful life either through material recycling schemes or by returning back to the manufacturer, then take only 50% of the total weight or volume of the material in the calculations.

Excluded Elements - Mechanical, electrical and plumbing components and specialty items such as elevators and equipment shall not be included in the calculation.

High grade uses - Following are considered to be *high-grade uses*:

Bound

- Structural frame;
- Floor slabs including ground floor slabs;
- Bitumen or hydraulically bound base, binder, and surface courses for paved areas and roads.

Unbound

- Asphalt-based or similar road surfaces
- Granular fill and capping
- Pipe bedding
- Sub bases/building foundations
- Gravel landscaping.

Crushed masonry used as fill material for general landscaping is not considered to be *high grade*. This practice is now common place on construction sites due to landfill costs.

Characteristic	No. of points available	Minimum standard
4.3 Local Materials and Products	1	No

Intent

To minimise environmental impact caused from shipment and transport of imported construction materials by specifying local alternatives.

Assessment Criteria

Where evidence provided demonstrates that a minimum of 75%, based on volume/mass of building materials or products (non structural elements) used in the project. These products shall be manufactured in Israel.

If only a proportion of a product has raw materials sourced locally then consider just the percentage of that material in the calculations.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A letter of intent from the design team or contractor confirming the following:</p> <ul style="list-style-type: none"> Percentage of local materials specified to the total volume/mass of all building materials. Details of the location and distance of the source of local materials. 	<p>A letter of intent from the design team or contractor confirming the following:</p> <ul style="list-style-type: none"> 'As made' percentage of local materials specified to the total volume/mass of all building materials. <p>For each locally sourced material, a letter of from the product manufacturer confirming:</p> <ul style="list-style-type: none"> The local extraction and manufacturing of products Final volume/mass for materials supplied. <p>A copy of 'As made' plan for all the construction materials clearly identifying individual building elements where local materials have been specified.</p>

Notes and References

Mechanical, electrical and plumbing components and specialty items such as elevators and equipment must not be included in this calculation. Include only building materials included in the project.

Characteristic	No. of points available	Minimum standard
4.4 Responsible Sourcing of Materials	1	No

Intent

To specify basic building elements that are manufactured using responsibly sourced raw materials from managed resources and supply chain processes.

Assessment Criteria

Responsible Sourcing of Materials shall comply with the requirements of Israel standard SI 18001 or SI 10000 or SA 8000 or AA 1000 or the requirements of "Social responsibility (maala)".

Where evidence provided demonstrates that at least 10% of the materials and products suppliers are responsibly sourced. This criteria applies to the following key building elements:

- Frame
- Ground floor
- Upper floors
- Roof
- External walls
- Internal walls (Including separating walls)
- Foundations/substructure (excluding sub-base materials)
- Staircase

Assessed materials include:

- Brick (Including clay tiles and other ceramics)
- Concrete (including in situ and pre cast concrete, blocks, tiles, mortars, cementitious renders etc.,)
- Bituminous materials, such as roofing membranes and asphalt

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	In renovation projects assess only newly specified applicable materials. Exclude re-used in situ materials from the assessment.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A letter of intent from the design team confirming:</p> <ul style="list-style-type: none"> • Specification and assessed materials in key building elements • Quantity of applicable material types comprising individual element specification <p>A letter of intent from the developer or contractor to use suppliers who can provide Environmental Management Systems (EMS) certificate, or equivalent, for the manufacturing process and /or extraction stages of their product.</p>	<ul style="list-style-type: none"> • As built drawings or as built specifications confirming that the building has been constructed in accordance with the design stage drawings/specifications. • Calculations confirming the final quantity of certified materials used. • A copy of EMS certificate (ISO 14001 or Eco-Management and Audit Scheme) for the manufacturing process and /or extraction stages of the raw materials for the assessed products. • For small scale product suppliers, provide confirmation that the company EMS is in line with BS 8555 2003 (or equivalent). • For materials with recycled content: <ul style="list-style-type: none"> ○ Provide manufacturers documentation to confirm the quantity of recycled content ○ EMS certificate for the manufacturing process

Notes and References

Responsible Sourcing - This can be demonstrated through auditable third party certified Environmental Management Systems for the Key process and Supply chain.

Key process - the final major aspects of processing that are carried out. There may be a single process or multiple processes requiring assessment, depending on the end product. The requirements for each of the assessed materials are detailed in the table below.

Supply chain - covers all of the major aspects of processing and extraction involved in the supply chain for the end product. Note that recycled materials are not required to demonstrate a Supply Chain EMS. If EMS certification is provided for the Key Processes for recycled materials, this is assumed by default.

EMS certification requirements

Material	Key process	Supply chain process
Brick (including clay tiles and other ceramics)	Product Manufacture	Clay Extraction
In situ Concrete (including ready mix and cementitious mortars and renders)	Ready mixed concrete plant	Cement production Aggregate extraction and production
Precast concrete and other concrete products (including blocks, cladding, precast flooring, concrete or cementitious roof tiles)	Concrete product manufacture	Cement production Aggregate extraction and production
Bituminous materials, such as roofing membranes and asphalt	Product manufacture	Bitumen production Aggregate extraction and production

Characteristic	No. of points available	Minimum standard
4.5 Environmental Certified Supplier of Materials	1	No

Intent

To use manufacturers and suppliers of materials that have proven sustainability credentials within their own company

Assessment Criteria

Where evidence provided demonstrates that the company has a recognised Environmental Management Systems (EMS) certificate, such as SI 14001 which IS respectively equal to ISO 14001.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	In renovation projects assess only newly specified applicable materials. Exclude re-used in situ materials from the assessment.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A letter of intent from the developer or contractor to use suppliers who can provide Environmental Management Systems (EMS) certificate.	<ul style="list-style-type: none"> • A copy of EMS certificate SI 14001. • For small scale product suppliers, provide confirmation that the company EMS is in line with BS 8555 2003 (or equivalent).

5. Health & Wellbeing

Characteristic	No. of points available	Minimum standard
5.1 Bioclimatic Design – Wind	2	Yes

Intent

Recognition of the wind regime at the planned project location, for exposure of the open areas adjacent to the building and protection against undesirable winds.

Assessment Criteria

Assessment Criteria	Points
A. Presentation of the wind rose graph and analysis of the wind regime during the four seasons of the year, including presentation of the desirable wind directions for ventilation and the undesirable wind directions.	0
B. According to the wind regime and the analysis carried out, the physical solutions to be applied in the project that are suitable for the location shall be presented, in order to protect against undesirable winds on the one hand and/or allow ventilation in the summer.	
B1- Application of physical solutions for protection open spaces against undesirable winds.	1
B2- Application of physical solutions to allow ventilation of open spaces in the summer.	1
C. Presentation of the wind regime on the pedestrian level created by the proposed project. This presentation shall be by means of computerized simulation (CFDesign, Fluent/ANSYS, enviMET, Urbawind, IES VE or equivalent) or by means of wind tunnels. It shall be shown that the wind velocities reached in open areas around the proposed project do not deviate from the maximum wind recommendations allowed from the mechanical viewpoint, and that it meets the requirements for thermal comfort, according to the intended use of the open areas. The area checked shall include the plot limits and all the buildings and open areas bordering on the project plot. In addition, the area around the tallest building in the plot of a radius of twice its height shall be included. This clause is mandatory for buildings :	according to conditions C1 and C2
C1. located more than 150 m above sea level or at a distance less than two km from the sea.	1
AND	
C2. If their length is greater than 90 m or their height is greater than 45 m.	

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above	There are no additional or different criteria to those outlined above

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<ul style="list-style-type: none"> Report including design and schematic engineering drawings showing application of physical systems for allowing ventilation strategies and dealing with undesirable wind Modelling results from approved software showing wind velocities reached in open areas around the proposed project do not 	<p>Assessor's building/site inspection (or "as built" drawings) and site measurements showing:</p> <ul style="list-style-type: none"> Physical systems have been installed/ are in place in accordance with report Measurements of wind velocities confirming velocities reached in open areas around the proposed project do not devi-

deviate from the maximum wind	ate from the maximum wind
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Notes and References

Approved software: CFDesign, Fluent/ANSYS, enviMET, Urbawind, IES VE or equivalent.

Other software should include at least one of the following turbulence models: K-Epsilon, K-Omega and/or LES.

Appendix C

Draft

Characteristic	No. of points available	Minimum standard
5.2 Comfort Ventilation	4	Yes

Intent

To establish air rates and ventilation solutions for achieving thermal comfort without AC.

Assessment Criteria

The following demonstrates compliance and must take into consideration the bioclimatic wind study done in characteristic 5.1:

1. 60% of the building's usable floor area should have operable windows /building envelope (see remark). (Relevant in residential buildings only if the HVAC system is provided with the building)

1

2. Solutions for natural comfort ventilation: Occupied spaces of the building are designed to be capable of providing fresh air entirely via a natural comfort ventilation strategy, without AC (see remark), demonstrated via EITHER of the following:

3

a. the operable window areas are on opposite sides and evenly distributed across the area to promote adequate cross-ventilation.

(e.g. there are at least 2 windows in different walls while the angle between these walls is at least 90 degrees the window's area is at least 0.8 sq.m)

OR

b. In cases where the openings are not in opposite directions, the design should demonstrate (by calculation, computer software or using ventilation design tool types recommended by CIBSE AM1015) that the natural ventilation strategy provides adequate cross flow of air to maintain ventilation rates.

OR

c. By using design solution to enhance natural ventilation as is shown in CIBSE AM1015.

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>1. Design team calculations and/ or performance specification criteria confirming:</p> <ul style="list-style-type: none"> The fresh air rate set for each space <p>2&3. Design plans and elevations, specification or calculations confirming:</p> <ul style="list-style-type: none"> Ventilation strategy in each <i>occupied space</i> The depth of the room Gross internal floor area of each <i>occupied space</i> The type of window/ventilator and total <i>operable area</i> The location of openings 	<p>1. For a naturally ventilated building, a formal letter of declaration from the design team or main contractor confirming the building has been built in accordance with a design compliant with the SI 5281 criteria. For a mechanically ventilated building, the commissioning manager's performance testing report confirming:</p> <ul style="list-style-type: none"> The required fresh air rates are achieved. <p>2&3. Assessor's site inspection report and photographic evidence confirming:</p> <ul style="list-style-type: none"> The ventilation openings and controls are installed in accordance with compliant design stage evidence. *

<ul style="list-style-type: none"> The type and degree of user-control. <p>AND (where relevant) A copy of the results from the appropriate software modelling tool demonstrating compliance.</p>	<p>A formal letter from the design team or main contractor confirming:</p> <ul style="list-style-type: none"> No changes have occurred since design stage. <p>Where changes have occurred since design stage, 'as-built' drawings, specification and calculations (as outlined under design stage evidence) that re-confirms compliance.</p>
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Notes and References

The operable window area is defined as the geometric free ventilation area created when a ventilation opening, e.g. window, is open to its normal operational fully designed extent (i.e. this excludes open areas created when reversible windows are opened for cleaning etc). It is not the glazed area of a façade or the glazed area of the part of the window that is operable (unless it opens fully).

REMARK: When the HVAC system is provided with the building, all operable windows must include open detection sensor switch connected to the HVAC unit to shut off the air condition when the windows are open, to prevent energy loss.

Draft

Characteristic	No. of points available	Minimum standard
5.3 Supply of Fresh Air from a Clean Source	2	Yes

Intent

To establish minimum indoor air quality levels in building in terms of quality of air supply – reducing the effects of toxins and potential acute and chronic illnesses.

Assessment Criteria

Assessment Criteria	Points
<p>1. Air-conditioned and mixed-mode buildings: Where the building's air intakes and exhausts are over 10m apart to minimise recirculation air intakes locations must take into consideration the wind regime and the table of polluting sites published by the Ministry of Environment. Intakes should be taken into consideration in all buildings where central air condition systems are installed.</p> <p>In all building types excluding residential buildings, if a source of external pollution exists, the ventilation system must filter the air according to ASHRAE 62.1-2007 until SI 6210 is issued and the table of pollutants published by the Ministry of Environment.</p> <p>OR</p> <p>2. Naturally-ventilated buildings: Where intake of fresh air is at a height of more than 10m above the ground and a distance of more than 15m from contaminated air.</p> <p>3. Underground parking: Where the building air intake exceeds 60% of the total volume required for the under-ground basement parking exhaust. Air exhaust should be extracted from the top building height or the highest roof of the building.</p> <ul style="list-style-type: none"> • 10 m • Above 25 m 	<p>0</p> <p>0</p> <p>1</p> <p>2</p>

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>Marked-up plan highlighting:</p> <ul style="list-style-type: none"> • Locations of intakes, extracts, operable windows, ventilators • Any existing or proposed sources of external pollution. 	<p>Assessor's site inspection and drawings:</p> <ul style="list-style-type: none"> • Locations of intakes, extracts, operable windows, ventilators • Proximity of any sources of external pollution to the above.

Notes and References**Sources of external pollution**

This includes the following: Highways and the main access roads on the assessed site; Car parks and delivery/vehicle waiting bays; Other building exhausts, including from building services plant industrial/agricultural processes; cooling towers and irrigation water

Excluded sources Service and access roads with restricted and infrequent access (for example roads used only for waste collection) are unlikely to represent a significant source of external pollution. These roads can therefore be excluded from the criteria of this issue. This does not include vehicle pick-up/drop-off or waiting

Characteristic	No. of points available	Minimum standard
5.4 Indoor Air Quality	3	Yes

Intent

To establish adequate air quality levels.

Assessment Criteria

Assessment Criteria	Points
1. Fresh air rates in the building: should be according to ASHRAE 62.1-2007. This section is relevant to all building types excluding residential.	0
2. Solutions for mechanical ventilation: Increase air ventilation rates to all occupied spaces by at least 20% above the minimum rates required by ASHRAE Standard 62.1-2007 and ASHRAE Standard 62.2-2007 until SI 6210 is issued. This section is relevant to all building types excluding residential.	1
3. Enhancing air quality a. Occupied spaces of the buildings designed with EU certified unizators (ion release agents) and ozone release systems.	1
4. Co2 sensors connected to fresh air intakes, where necessary according to ASHRAE Standard 62.1-2007 and ASHRAE Standard 62.2-2007 until SI 6210 is issued.	1

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
TBD	TBD

Characteristic	No. of points available	Minimum standard
5.5 Control at User Level – Lighting	0	N/a

Not assessed in this Standard

Draft

Characteristic	No. of points available	Minimum standard
5.6 Control at User Level – Natural Illumination and Glare	2	No

Intent

To reduce problems associated with glare in occupied areas through the provision of adequate controls.

Assessment Criteria

Assessment Criteria	Points
The following demonstrates compliance: An occupant-controlled shading system on all windows, glazed doors and rooflights in all <i>relevant building areas</i> .	
a. Interior shading systems	0.5
b. Exterior shading systems	1.5

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>Marked-up copy of the design plan(s) confirming:</p> <ul style="list-style-type: none"> A description of the function of each of the building spaces. <p>A copy of the relevant specification clause(s), window schedule or design plan confirming:</p> <ul style="list-style-type: none"> Type of shading system(s) and control to be installed. 	<p>Assessor's building/site inspection and photographic evidence confirming:</p> <ul style="list-style-type: none"> Installation of compliant glare control system.

Notes and References

Where the term '*relevant building areas*' is referenced it refers to any areas of the building where there are, or will be, workstations/benches, desks and/or close work will be undertaken or visual aids used.

Occupied space: A room or space within the assessed building that is likely to be occupied for 30 minutes or more by a building user and, with respect to this issue, where it would be desirable to limit the potential for glare or provided a system of glare control.

Characteristic	No. of points available	Minimum standard
5.7 Control at User Level – Temperature	2	Yes

Intent

To recognise and encourage the provision of user controls which allow independent adjustment of heating/cooling systems within the building.

Assessment Criteria

Assessment Criteria	Points
1. A central switch will be located at the entrance of each dwelling unit to shut off air-condition circuits.	0
2. The heating/cooling system is designed to allow occupant control of zoned areas within all occupied spaces in the building. In open space layout design, where occupancy layout is not known, temperature control can be zoned on the basis of 40m ² grids. The temperature control unit will be proportional to the ambient temperature. AND The zoning allows separate occupant control (within the occupied space) of each perimeter area (i.e. within 7m of each external wall) and the central zone (i.e. over 7m from the external walls).	1
3. Occupancy sensors.	1

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the relevant clauses of specification and/or marked-up M&E drawings confirming: <ul style="list-style-type: none"> • Scope of the heating/cooling system • The type of user controls for the above systems • The scope of the controls i.e. control zone. 	Assessor's building/site inspection and photographic evidence confirming: <ul style="list-style-type: none"> • Installation of user controls in each <i>occupied space</i>.* *For large buildings it would not be expected that the assessor check every individual <i>occupied space</i> , but a random selection of spaces that confirm compliance.

Notes and References

Separate Occupant Control: Heating/cooling controls for a particular area/zone of the building that can be accessed and operated by the individual(s) occupying that area/zone. Such controls will be located within, or within the vicinity of, the zone/area they control.

The areas where building users would not expect, or be expected, to control temperature in the space, including the following: Atria/association space; entrance halls/reception areas; circulation areas; and storerooms

Characteristic	No. of points available	Minimum standard
5.8 View Out	1	No

Intent

Create a visual link between indoor space and the outside environment – increasing awareness of the outside environment and reducing risk of eyestrain.

Assessment Criteria

1. All living rooms (in self contained flats), communal lounges and individual bedrooms/studios in sheltered housing are within 5m distance of a wall with a window or permanent opening providing an adequate view out, where the window/opening is $\geq 20\%$ of the total inside wall area.
2. All other relevant building areas within 7m distance of a wall with a window or permanent opening providing an adequate view out, where the window/opening is $\geq 20\%$ of the total inside wall area (refer to compliance notes for a definition of *relevant building areas* and *adequate view out*).

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Design plan and elevation showing: <ul style="list-style-type: none"> • All <i>relevant building areas</i> and room depths • Actual or notional workstations/desk layout • Window/open areas Site plan showing: <ul style="list-style-type: none"> • Building location and proximity to external obstructions 	Assessor's site inspection report and photographic evidence confirming: <ul style="list-style-type: none"> • All <i>relevant building areas</i> comply. OR As made drawings or a formal letter form the design team confirming: <ul style="list-style-type: none"> • No changes have occurred since design stage, therefore design stage evidence demonstrates compliance post construction.

Notes and References

Adequate view out: The view out should ideally be through an external window providing a view of a landscape or buildings (rather than just the sky) in the *relevant building areas*. A view in to an internal courtyard or atrium will comply provided the distance from the opening to the back wall of the courtyard/atrium is at least 10m (therefore allowing enough distance for the eyes to refocus). The view cannot be an internal view across the room, as this is likely to become obstructed by partitions, filing cabinets etc.

The indoor space area is measured according to the main area only, not including dressing rooms and bathrooms even if they are contained within the total principal area.

Characteristic	No. of points available	Minimum standard
5.9 Daylighting and Visual Comfort	1	Yes

Intent

To give users sufficient access to daylight.

Assessment Criteria

Building to comply with requirements listed in Standard 5282 Part 1

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
TBD	TBD

Notes and References

TBD

Characteristic	No. of points available	Minimum standard
5.10 Glare from Internal Lighting	0	N/a

Not assessed in this Standard

Draft

Characteristic	No. of points available	Minimum standard
5.11 Internal and External Lighting Levels	0.5	No

Intent

To ensure lighting has been designed in line with best practice for visual performance and comfort.

Assessment Criteria

The following demonstrates compliance:

1. Illuminance (lux) levels in the indoor main function of the building (class-rooms) areas of the building are specified in accordance with SI 8995.
2. Illuminance levels for lighting in all external areas within the open areas are specified in accordance with EN 12464-2:2007.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>EITHER A copy of the specification or relevant room schedules confirming:</p> <ul style="list-style-type: none"> • The internal/external maintained illuminance levels AND/OR • The standards that the illuminance levels are specified to. <p>OR A formal written declaration of conformity from the relevant member of the design team confirming:</p> <ul style="list-style-type: none"> • The maintained illuminance levels for each internal/external space are in compliance with the relevant Standard. 	<p>A formal written declaration from the design team or main contractor confirming:</p> <ul style="list-style-type: none"> • Light fittings have been installed in compliance with the lighting specification. • No changes have occurred in the lighting specification used to demonstrate design stage compliance. <p>Where changes have occurred, a further declaration is required confirming that the revised lighting specification is in compliance with the SI 5281 criteria.</p>

Notes and References

Refer to: SI 8995.

Characteristic	No. of points available	Minimum standard
5.12 Use of lamps having Colour Rendering Index, CRI, of at least 80	0	N/a

Not assessed in this Standard

Draft

Characteristic	No. of points available	Minimum standard
5.13 Acoustic Quality – Maximum Noise Level	1	No

Intent

To ensure the acoustic performance of the spaces meets appropriate standards according to those required by the character of the spaces – helping work productivity

Assessment Criteria**Points**

1. Indoor ambient noise levels ^(*), with the windows closed comply with the following:

Maximum Ambient Noise Level	Function
37 dB L_{Aeq} - for 1 hour (night)	Bedroom
40 dB L_{Aeq} - for 1 hour (night)	Living room or workroom

Points in accordance with this clause will be awarded only where the outside noise level justifies the acoustic insulation

2. Pre-completion acoustic testing is carried out by a *suitably qualified expert* to ensure that all relevant spaces (as made) achieve the performance standards required, and any required remedial works in spaces that do not meet the standards are completed prior to handover and occupation.

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>1. A copy of the design plan for each level of the building with each room/area clearly labeled.</p> <p>A copy of the specification clause or acoustician's calculations confirming:</p> <ul style="list-style-type: none"> Indoor ambient noise levels in each relevant room/area. The standards to which calculations/measurements have complied, or are required to comply with. <p>2. A copy of the specification clause or a formal letter from the project team confirming:</p> <ul style="list-style-type: none"> A programme of pre-completion acoustic testing by a <i>suitably qualified acoustician</i> will be commissioned. 	<p>Copies of acoustic field test report/results confirming:</p> <ul style="list-style-type: none"> The required performance levels have been achieved for each room/area of the completed building. Where relevant, any remedial work/actions required to meet the performance standards. <p>A letter from the design team or main contractor confirming:</p> <p>Any and all required remedial works have been carried out in accordance with the acoustician's recommendations.</p>

Notes and References**Measurement/calculation procedures**

The following procedures must be followed by the acoustician when measuring or calculating the levels required to demonstrate compliance:

- Noise from both internal sources (e.g. mechanical ventilation systems, plant noise) and external sources (e.g. traffic noise transmitted via the building façade) should be included, and,

where windows are operable as part of the ventilation strategy, these should be assumed to be open for the purposes of calculations and open for measurements.

- Noise from occupants and office equipment (e.g. computers) should not be included in the measurements.
- Measurements should be made in at least four rooms in which noise levels can be expected to be greatest either because they are on the noisiest façade or because they are on a naturally ventilated façade.
- Where different ventilation strategies are used, measurements should be conducted in rooms utilising each strategy. Otherwise, measurements should be made in rooms on the noisiest façade.
- T in $L_{Aeq,T}$ is taken as the duration of the normal working day (typically 8 hours between 09.00 and 17.00).
- Measurements need not be made over a period of 8 hours if a shorter measurement period can be used. In this case, measurements should be made when external noise levels are representative of normal conditions throughout the day.
- Measurement periods less than 30 minutes may give representative values for indoor ambient noise levels and may be utilized where this is the case. However measurement periods shorter than 5 minutes should not be used.
- Measurements should be taken in a minimum of 3 locations in rooms at a height of 1.2 m above the floor level and at least 1 m away from any surfaces.

Characteristic	No. of points available	Minimum standard
5.14 Acoustic Quality – Passage of Noise	1	No

Intent

To ensure the acoustic performance of the spaces meets appropriate standards according to those required by the character of the spaces

Assessment Criteria

Prevention of noise passing between walls and ceilings (floors) in a building, as specified below:

Points

in Decibels	Passage of Noise
53 (DnT,W)	a. Airborne sound insulation
60 (L'nT,W)	b. Impact sound insulation

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the design plan for each level of the building with each room/area clearly labelled. A copy of the specification clause or acousticians calculations confirming: airborne and impact sound insulation levels	A copy of acoustician's test report

Characteristic	No. of points available	Minimum standard
5.15 Limitation of Volatile Organic Compounds (VOC) and Other Indoor Contaminants	1	Yes

Intent

Reduction of health injuries due from exposure to volatile organic compounds.

Assessment Criteria

Indoor materials will meet the specifications for emission levels according to:

1. If there is a "green specification" by SII, the material will comply with the "green specification".
2. If no "green specification" is available, the material will comply with the relevant Israeli Standard.
3. If there is no relevant "green specification" or Israeli standard, the material will meet the International/European/American standards.
4. Radioactive Materials Building Products
Where evidence provided demonstrates that the natural radioactive elements in the building products specified meet the requirements and test methods outlined in Israeli Standard SI 5098 Content of radioactive elements in building materials.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A copy of the relevant specification clause confirming:</p> <ul style="list-style-type: none"> • The VOC content of the relevant specified product types will comply with the standards specified above. 	<p>For each relevant product, a formal letter from or copies of the manufacturer's literature confirming:</p> <ul style="list-style-type: none"> • The standard(s) against which the product is tested • The VOC emissions achieved • The VOC emissions meet the required level. • The levels of VOC emissions will be tested after the building (office or public) is furnished or after completion of finishing materials if the furniture is not provided. • AND a certified laboratory approval

Notes and References**Volatile Organic Compounds**

Examples of VOC emitting products include: paints and lacquers, paint strippers, cleaning supplies, pesticides, building materials and furnishings, glues and adhesives, Urea-formaldehyde foam insulation (UFFI), pressed wood products (hardwood plywood wall paneling, particleboard, fibreboard) and furniture made with these pressed wood products.

The emissions of VOCs from paints and varnishes are regulated by the Directive 2004/42/CE. Products containing high organic solvent content should also be avoided (EU VOC Solvent Directive 1999/13/EC).

Exposure risk assessment of any possible release of chemicals from manufactured products and their possible impact on health and the environment generally, is an important requirement of European regulations. The possible impact of a building product on indoor air quality is included in the European Construction Products Directive, 89/106/EEC. The amended Directive, 93/68/EEC provided the criteria for CE Marking of products.

Products to be fitted in buildings should not contain any substances regulated by the Dangerous Substances Directive 2004/42/CE, which could cause harm to people by inhalation or contact. Materials containing heavy metals (e.g. antimony, barium, cadmium, lead and mercury) and other toxic elements (e.g. arsenic, chromium and selenium) or regulated biocides (e.g. pentachlorophenol) should be avoided.

Dangerous substances are defined in the Dangerous Substances Directive (67/548/EEC)

Draft

Characteristic	No. of points available	Minimum standard
5.16 Electromagnetic and Micromagnetic Radiation	0	Yes

Intent

Protection against health injuries from exposure to electromagnetic and micromagnetic radiation of high intensities.

Assessment Criteria

A check was conducted in the building for categorized radiation from sources of transformer installations and electricity transport and/or transmitting centers with the result that the radiation is not higher than permitted according to the recommendations of the Ministry of the Environment.

No installation of cellular antenna will be allowed in sustainable buildings

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
	A check was conducted in the building for categorized radiation from sources of transformer installations and electricity transport and/or transmitting centers with the result that the radiation is not higher than permitted according to the recommendations of the Ministry of the Environment.

Characteristic	No. of points available	Minimum standard
5.17 Refrigerant Global Warming Potential, GWP	0	Yes

Intent

To reduce the contribution to climate change from refrigerants with a high global warming potential.

Assessment Criteria

Where applicable, the following demonstrates compliance:

1. The building has no refrigerants

OR

2. The refrigerants used within the building services have a GWP less than 5.

All gases in use should be green according to the list provided by the Ministry of the Environment.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A copy of the specification clause confirming either:</p> <ul style="list-style-type: none"> Absence of refrigerant in the development OR Type(s) of refrigerant to be used. <p>AND</p> <p>Manufacturer's information confirming:</p> <ul style="list-style-type: none"> GWP of each refrigerant. 	<p>Assessor's building/site inspection and as built drawings confirming:</p> <ul style="list-style-type: none"> Presence or absence of any refrigeration plant. <p>OR</p> <ul style="list-style-type: none"> A letter from the design team/developer confirming: <ul style="list-style-type: none"> The refrigerant type specified remained unchanged. <p>OR</p> <p>Where a change has occurred, written confirmation from the design team confirming:</p> <ul style="list-style-type: none"> Type of refrigerant(s) used. <p>AND</p> <p>Manufacturer's information confirming:</p> <ul style="list-style-type: none"> GWP of each refrigerant.

Notes and References

Solid refrigerant: the characteristic can be awarded by default where a solid refrigerant is used.

Refrigerant charge less than 5kg: the characteristic can be awarded where the total refrigerant charge used in the building services is less than 5kg.

Global Warming Potential: GWP is defined as the potential for global warming that a chemical has relative to 1 unit of carbon dioxide, the primary greenhouse gas. In determining the GWP of the blowing agent, the Intergovernmental Panel on Climate Change (IPCC) methodology using a 100-year Integrated Time Horizon (or ITH) should be applied.

Refrigerant: there are three main make-ups of refrigerants:

- Hydrogenated Fluorocarbon Refrigerants (HFCs) are made up of hydrogen, fluorine, and carbon. Because they do not use a chlorine atom (which is used in most refrigerants) they are known to be one of the least damaging to our ozone.
- Hydrogenated Chlorofluorocarbon Refrigerants (HCFCs) are made up of hydrogen, chlorine, fluorine, and carbon. These refrigerants contain minimal amounts of chlorine; they are not as detrimental to the environment as some other refrigerants.
- Chlorofluorocarbon Refrigerants (CFCs) contain chlorine, fluorine and carbon. These refrigerants carry high amounts of chlorine so they are known for being the most hazardous to the ozone layer.

Hydrocarbons and ammonia-based refrigerants have low or zero GWP and are therefore preferred long-term options. These are now widely available and are valid alternatives to HFCs in all buildings, provided health and safety issues are fully addressed.

Draft

Characteristic	No. of points available	Minimum standard
5.18 NO _x Emissions	0.5	No

Intent

To encourage the supply of heat from a system that minimises NO_x emissions, and therefore reduces pollution of the local environment.

Assessment Criteria

The following demonstrates compliance:

Where the dry NO_x emissions from delivered space heating energy are ≤100 mg/kWh (at 0% excess O₂).

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects	There are no additional or different criteria to those outlined above specific to renovation projects

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the specification clause confirming: <ul style="list-style-type: none"> Type of heating system(s) installed. 	Assessor's building/site inspection and photographic evidence confirming: <ul style="list-style-type: none"> Heating system(s) installed.

Notes and References

NO_x emissions: are pollutant gases produced by the combustion of fossil fuels. NO_x reacts with heat and sunlight to produce ozone that can cause serious respiratory problems. It also reacts with water to produce acid rain which has a detrimental effect on ecosystems.

Dry NO_x Levels: the NO_x emissions (mg/kWh) resulting from the combustion of a fuel at 0% excess oxygen levels.

Characteristic	No. of points available	Minimum standard
5.19 Drinking Water	0	N/a

Not assessed in this Standard

Draft

Characteristic	No. of points available	Minimum standard
5.20 Specification of Laboratory Fume Cupboards	0	N/a

Not assessed in this Standard

Draft

6. Waste

Characteristic	No. of points available	Minimum standard
6.1 Recyclable Operational Waste Storage	2	Yes

Intent

To facilitate the reduction of waste disposed of in landfills by providing infrastructure for the collection, handling and removal of waste and recyclables.

Assessment Criteria

The design of the building shall allow the separation of various types of waste and/or streams (such as dry and wet) as follows:

Waste collection and an adequately designed collection installation for one recycling element.

Waste collection and adequately designed collection installations for two recycling elements.

Waste collection and adequately designed collection installations for three recycling elements and more.

Points

0

1

2

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>Marked up building/site plan and copy of the specification confirming:</p> <ul style="list-style-type: none"> the design of the collection installation/s can adequately manage the amount of waste the building has been forecast to produce in order to minimise any potential irritants. description of the labelling <p>Provide a copy of the contract or other documentation with a waste contractor that confirms a service has been established for the collection and recycling of recyclable materials.</p>	<p>Assessor's building/site inspection and photographic evidence confirming:</p> <ul style="list-style-type: none"> the location, size and capacity of the recyclable storage provision labelling of the dedicated facilities

Notes and References

It is well recognised that landfilling is no longer the answer to Israel's solid waste problem. Efforts have subsequently focused on a number of initiatives including recycling to help direct waste away from landfill. Providing an adequately sized and conveniently located space for the collection of recyclable waste will encourage occupants to participate in recycling and facilitate collection by an outside waste contractor.

All of the waste collection, recycling and separation installations should be designed in compliance with the Design and Building Law, including its regulations, the Business Licensing Law and Public Health Regulations.

The number of recycling elements can only be approved by the local authority or any other certified authority (subject to presentation of a document and proper approval).

Reference should be made to the Building Code for guidance on the size, location of storage (including internal recycling bins) and separation of waste.

Garbage chutes – where required reference should be made to the Building Code for guidance on the specification of garbage chutes. In situations where a garbage chute is not required it is recommended that a space sized according to the information within the Building Code is allocated within the building for possible installation of a chute in the future.

A wet stream refers to rotting organic waste.

Dry streams include paper and cardboard, plastic, glass or metal.

Draft

7. Transport

Characteristic	No. of points available	Minimum standard
7.1 Access to Public / Alternative Transport	0	N/a

Not assessed in this standard

Draft

Characteristic	No. of points available	Minimum standard
7.2 Bicycle Parking and Facilities	1.5	No

Intent

To reduce reliance on the use of private vehicles and pollution by encouraging building occupants to cycle through the provision of appropriate easily accessible and secure parking and facilities.

Assessment Criteria

a) In regular residential land uses where density is equal to or higher than 12 units per dunam net provide one compliant bicycle parking space per dwelling

b) In Student Residences and Key Worker Accommodation, provide compliant bicycle parking spaces for 50% of residents PLUS 10% of building staff (where there are less than 10 staff, provide a minimum of one space).

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Site plan, design drawing and/or copy of the specification confirming: <ul style="list-style-type: none"> • number of building users and dwellings • location of cycle storage facilities: • number of cycle spaces; • type, dimension and layout of cycle racks; • lighting is in accordance to EN 12464-2:2007 or SI 13201 • number of showers and changing facilities provided; • type, dimension and layout of lockers; 	Inspection of site and photographic evidence confirming the installation of the compliant facilities.

Notes and References

Cycling as a form of transport helps to relieve congestion on the roads and reduce air pollution; as well as promoting a healthy lifestyle. Providing facilities for building occupants to store their bicycles safely and shower and changing facilities will encourage the use of bicycles for commuting purposes.

Compliant bicycle storage spaces are those that meet the following:

- is covered overhead to protect from the rain;
- the covered area and cycle racks are fixed to a permanent structure and allow both the wheel and frame to be locked securely or are covered by CCTV surveillance;
- there is a minimum distance of 0.8m between cycle racks;
- adequate lighting is provided;
- the bicycle storage is in a prominent position and capable of being

- seen from the building;
the bicycle storage is located within 150m of the building entrance

Draft

Characteristic	No. of points available	Minimum standard
7.3 Safe Pedestrian and Cycle Routes	0.8	No

Intent

To encourage the provision of safe and secure pedestrian and cycle access routes within the lot development.

Assessment Criteria

In regular residential land uses where density is equal to or higher than 12 units per dunam net the following must be achieved to demonstrate compliance:

- Cycle lanes and pedestrian paths are designed and constructed in accordance with best practice standards
- Cycle lanes provide direct access to any cycle parking facilities on site without the need to deviate from the cycle path and connect to offsite cycle paths where these run adjacent to development's boundary
- On site footpaths connect to public footpaths off site
- Where provided drop off areas are designed to provide direct access to pedestrian pathways/areas, therefore avoiding need for the pedestrian to cross vehicle access routes
- Where dedicated pedestrian crossing of a vehicle access route is provided, the road is raised to the pavement level (i.e. the pavement is not lowered to road level)
- Delivery areas are not accessed through parking areas and do not cross or share pedestrian and cyclist routes and other outside amenity areas accessible to building users and general public.
- Lighting design of pedestrian pathways and cycle paths on site are in compliance with the instructions for pedestrian and cycle pathways.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A scaled proposed site plan, specification and/or design details showing: <ul style="list-style-type: none"> • all necessary features and dimensions • that cycle routes have been designed in accordance with best practice guidance • External lighting design strategy 	Inspection of site and photographic evidence confirming compliance.

Notes and References

The quality of the local streetscape has an impact on people's desire to walk or cycle both within a city and neighbourhood scale. Providing safe, secure and quality walking and cycling environments will actively encourage people to walk and cycle improving their health and reducing reliance on private vehicles; which in turn reduces congestion and pollution.

Cycle lanes and pathways will be in compliance with the Instructions for pedestrian and cycle

pathways of the Ministry of Construction and Housing and the Ministry of Transport and Road Safety (with reference to SI 13201).

Draft

8. Management

Characteristic	No. of points available	Minimum standard
8.1 Recyclable Construction Waste Storage	1	Yes

Intent

To facilitate the reduction of waste disposed of in landfills by providing storage facilities for the building's construction-related recyclable waste streams

Assessment Criteria

Develop and implement a construction waste management plan that as a minimum identifies the materials to be diverted from landfill, sets targets for the amount of waste to be diverted and procedures for monitoring, measuring and reporting waste generation.

AND

Provide appropriately sized and easily accessible storage to enable the segregation of substantial recyclable construction waste into:

- a) three types
- b) five types

Points

0
1

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>A copy of the construction waste management plan containing the appropriate commitments, targets and procedures.</p> <p>Marked up building/site plan and/or copy of the specification confirming:</p> <ul style="list-style-type: none"> • location of the dedicated recyclable storage area • the capacity of the storage provision • description of the labelling 	<p>Assessor's building/site inspection and photographic evidence confirming:</p> <ul style="list-style-type: none"> • the location, size and capacity of the recyclable storage provision • labelling of the dedicated facilities

Notes and References

The quantity of construction, demolition and excavation waste in Israel is estimated at 7.5 million tons. Of this only a third reaches designated sites, with the rest discarded in open spaces, fields and roadsides. Efforts are now focussing on promoting the transfer of waste to authorised sites and recycling of waste. Providing adequately sized and conveniently located space for the collection of recyclable waste will encourage contractors to participate in recycling and facilitate the collection by an outside waste contractor.

As a minimum storage should be provided to allow the segregation of the following types of waste:

- Metals
 - Concrete/ceramics
 - Paper/cardboard
-

Easily accessible storage is defined as:

- a) in a location with good vehicular access to facilitate collections
 - b) clearly labelled for recycling
-

Draft

Characteristic	No. of points available	Minimum standard
8.2 Recyclable Construction Waste Reuse and Removal	6	Yes

Intent

To reduce the illegal disposal of construction waste by promoting the reuse of materials on site and the use of authorised sites.

Assessment Criteria

Demonstrate that construction waste is removed and disposed of for recycling at a site authorised by the Ministry of Environmental Protection, measured as a percentage of the total waste quantity (volume or weight) generated by the site.

- > 35% of the total amount of construction waste
- > 55% of the total amount of construction waste
- > 70% of the total amount of construction waste

AND

Demonstrate that construction waste has been reused on site (measured as a percentage of the feasible total waste quantity)

- > 5% of the total amount of construction waste
- > 10% of the total amount of construction waste
- > 20% of the total amount of construction waste

AND

Demonstrate that the amount of construction waste has been minimised through the use of 80% of the envelope and structural elements using industrial forms and reductions in the amount of packaging.

The amount of waste can be calculated by volume or weight, but must be consistent throughout.

Points

- 0
- 1
- 2

- 1
- 2
- 3

- 1

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>Specifications and/or calculations showing the amount of construction waste it is predicted will be generated and how much will be</p> <ul style="list-style-type: none"> a) reused on site and b) disposed of at authorised sites, including the minimum value of waste for burial in accordance with the guidelines of the Ministry of Environmental Protection according the building type in tons/m² <p>A letter from the client or their representative confirming the location of the authorised site the construction waste is being taken to.</p>	<p>Copies of records showing the amount of construction waste generated and how much was disposed at authorised sites.</p>

Notes and References

The quantity of construction, demolition and excavation waste in Israel is estimated at 7.5 million tons. Of this only a third reaches designated sites, with the rest discarded in open spaces, fields and roadsides.

The illegal disposal of construction waste is one of the most serious environmental problems currently facing Israel. Efforts are now focussing on promoting the establishment of authorised sites for the disposal of construction, demolition and excavation waste. Where possible it is more environmentally beneficial for waste to be reused on site rather than diverted for recycling or reused elsewhere.

Draft

Characteristic	No. of points available	Minimum standard
8.3 Minimising Construction Site Impacts	0	Yes

Intent

To recognise and encourage well managed construction sites to reduce pollution, energy consumption and resource use.

Assessment Criteria

Assessment Criteria	Points
<p>The following demonstrates compliance:</p> <ol style="list-style-type: none"> 1. An appropriately qualified person is appointed internally or externally as an 'Environmental Performance Trustee' 2. Erection of a 2m high perimeter fence including gates and signage 3. Reduction of electricity and water consumption on site during setting up 4. Reduction of dust irritants on the site including driveways within the site boundary 5. Reduction of exceptional noise hazards and prevention of blinding 6. Ensure all trucks are covered when they exit the site 7. Mixers are rinsed in such a way that prevents wastewater permeating the soil 8. An authorised location either on site or outside (if there is insufficient room) for the storage of surplus dirt and aggregates for recycling. 9. Ensure the neighbourhood is kept informed regarding disturbances or interferences that may occur during the construction process 	

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<p>Marked up existing site plan showing:</p> <ul style="list-style-type: none"> • Landscape including ecology of the site (hot houses, plants, full grown trees at the site and on its borders) • Water sources • Buildings included in restoration plans • Residential and public buildings <p>Marked up site plan(s) showing location of:</p> <ul style="list-style-type: none"> • Site offices • Toilets/chemical toilets • Location for eating • Operational construction-waste storage containers • Waste bins • Refuelling points • Basins for the prevention of oil and fuel infiltration into the soil • Accessible pathways to the site (for 	<p>Assessor's building/site inspection and photographic evidence confirming location of facilities listed.</p> <p>Records/report confirming that the assessment criteria above have been carried out throughout the construction process.</p>

<p>pedestrians, vehicles or animals)</p> <ul style="list-style-type: none">• Report setting out how the assessment criteria above will be met throughout the construction process.	
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Notes and References

Construction sites can have significant impacts; especially at a local level. These can include pollution, waste, dust, noise, and vibration. By demonstrating competent management, efficiency and awareness of local environmental issues construction sites and companies will not only reduce pollution and other environmental impacts but also show themselves to be considerate and neighbourly.

The perimeter fence should extend to the ground to prevent erosion, prevent soil and erosion dispersion during construction, prevent water collection and damage to water sources.

Methods for reducing dust irritants could include wetting (using non-potable water), rubberised asphalt etc.

Areas provided for the storage of surplus dirt and aggregates for recycling should be covered to prevent dust pollution hazards.

Draft

Characteristic	No. of points available	Minimum standard
8.4 Commissioning of Building Services	2	Yes

Intent

To verify that the building services have been installed and calibrated to perform as intended in the project requirements.

Assessment Criteria

The following demonstrates compliance:

1. The developer (דזיין) shall appoint a person to lead, review and oversee the completion of the commissioning process
2. The commissioning specialist must review the owner's project requirements and design documents for clarity and completeness
3. Develop and incorporate commissioning requirements into the construction documents
4. Develop and implement a commissioning plan
5. Review contractor submittals applicable to systems being commissioned for compliance with the owner's project requirements and basis of design
6. Verify the installation and performance of the systems to be commissioned
7. Complete a quarterly and final summary commissioning report

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<ol style="list-style-type: none"> 1. A copy of a letter/document confirming the appointment someone to lead the commissioning process. 2. A copy of the construction documents showing the commissioning requirements have been included. 3. A copy of the commissioning plan confirming the scope of tasks. 4. A copy of the commissioning schedule confirming the scope of the periodical commissioning tasks. 5. A copy of the review reports undertaken. 	A copy of the quarterly and final summary commissioning report.

Notes and References

Commissioning is an important stage in most construction projects and ensures that building services and fabric perform in accordance with the project design. Benefits of commissioning include reduced energy use, lower operational costs, fewer contractor callouts, better building documentation and improved occupant productivity.

Commissioning must take place for the following building services (where applicable):

- heating, ventilation and air conditioning systems (mechanical and passive) and associated controls
- lighting and daylighting controls
- domestic hot water systems
- renewable energy systems
- Building Management Systems (BMS)
- Cold storage enclosures and refrigeration plant
- microbiological safety cabinets and fume cupboards
- Mechanical waste systems

Draft

Characteristic	No. of points available	Minimum standard
8.5 Building User Guide	0	Yes

Intent

To ensure guidance is provided for occupants so that they can understand and operate their home efficiently.

Assessment Criteria

A Building User Guide should be written to meet the needs of both the Facilities Management Team/Building Manager and building occupants.

The content should be written in a style and language that is appropriate for non-technical building users.

Note. This characteristic is mandatory for the following building types only:

- Office buildings over 2000m² (gross area)
- Residential buildings over 1500m² (gross area)
- Retail buildings over 3000m²

Performance, worship and school buildings of any size

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the specification clause confirming the requirement to develop a Building User Guide and the scope of the Guide's contents. OR A letter from the client/contractor confirming that the design team will be required to develop a Building User Guide and the contents will comply with the SI 5281 criteria.	A copy of the Building User Guide and written confirmation from the design team that it has been distributed to the building's owner / tenants(s).

Notes and References

Without the provision of sufficient information and guidance it is likely that the building will be used inappropriately leading to occupant dissatisfaction and wasted resources.

Building User Guide contents – the list below indicates the type of information that should be included:

1. Energy and Environmental Strategy

Information on energy-efficient features and strategies in relation to the building including an overview of the potential savings – stated for economic and environmental impact – to building users and occupants.

2. Monitoring and Targeting

Energy targets and benchmarks for the building and tenancy as well as a metering and sub-metering strategy with details on how to read, record, and present meter readings.

3. Building Services

A description of the basic function and operation of the following, with simplified systems diagrams and explanation of energy saving features:

- Ventilation
- Heating system
- Cooling system
- Electrical systems
- Lighting and
- Domestic hot water

4. Transport Facilities

Car parking requirements including details of the provision of cycling facilities, condition of access and appropriate use. Also provide, if applicable. Local public transport information, maps and timetables, and information or links on alternative methods of transport to the workplace (e.g. car pooling)

5. Materials and Waste Policy

Information on recycling including what can be recycled, where the recycling storage areas are, and schedules for waste/recycling removal. Include instructions on proper use for less common practices such as composting.

6. Expansion / Re-fit Considerations

A list of environmental recommendations for consideration, highlighting in particular the areas covered in the building users' guide and SI 5281.

7. References and Further Information

Links to relevant information including websites, publications and organisations pertaining to energy and water conservation, efficient building operation, indoor air quality/sick building syndrome, environmentally friendly design features etc.

Characteristic	No. of points available	Minimum standard
8.6 Consultation with Stakeholders	0	No

Intent

To involve relevant stakeholders in the design process to ensure the building provided is fit for purpose.

Assessment Criteria

Identify relevant stakeholders and develop a consultation plan which includes timescales and methods of consultation to be used.

Undertake the consultation and subsequently provide feedback to the stakeholder group regarding what actions have been taken in response to their suggestions.

Points

<i>New Build</i>	<i>Renovation</i>
There are no additional or different criteria to those outlined above specific to new build projects.	There are no additional or different criteria to those outlined above specific to renovation projects.

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
Provide: <ul style="list-style-type: none"> • List of stakeholders consulted • A copy of the consultation plan setting out the process and scope of consultation • Copies of agendas and minutes of meetings with stakeholders • Copies of documents demonstrating consultation feedback 	Evidence as outlined at Stage A.

Notes and References

Consultation is a formal process for getting people's input on a specific issue, analysing this input and using it to inform the development of a building design. Consultation is not a public vote, it is a qualitative exercise to seek evidence to help deliver the most effective and efficient outcome and is an important factor in achieving ultimate success.

Relevant stakeholders include - local residents, local businesses and community groups, building occupants (e.g. patients, students, teachers/lecturers, employees, tenants, etc), design team members, main contractor, local authority and health and safety representative. Director of Estates,

In situations where the building forms part of a new community still under construction a representative group of stakeholders should be identified.

Scope of the consultation – the following issues should be discussed during the consultation process functionality, building user satisfaction, management and operational implications, maintenance issues, local transport impacts and opportunities for shared use of facilities.

Characteristic	No. of points available	Minimum standard
8.7 Green Building Consultant (מלווה בנייה ירוקה)	0	N/a

Not assessed in this Standard

Draft

9. Innovation

Characteristic	No. of points available	Minimum standard
9.1 Use of Innovative Building Methods	3	No

Intent

To encourage the use of innovative building methods such as prefabrication and modular construction to lower costs, increase the speed of construction and the precision of work.

Assessment Criteria

The use of alternative building methods should be approved by the Building Research Laboratory in the Technion, Haifa.

Points

<i>New Build</i>	<i>Renovation / Fit-out</i>
There are no additional or different criteria to those outlined above specific to new build projects.	<p><i>Renovation</i> There are no additional or different criteria to those outlined above specific to renovation projects.</p> <p><i>Fit-out</i> This characteristic is not assessed in a fit-out project.</p>

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the building designs, layouts and specifications that show the type of building construction to be used and what elements will be prefabricated.	Assessor's building/site inspection and photographic evidence confirming the type of building construction used.

Notes and References

Using alternative buildings methods such as prefabrication and modular construction have a number of advantages, including:

- Economic – buildings typically have fewer defects and can be built more quickly
- Environmental – the buildings can be more energy efficient, may involve less transport of materials and produce less waste
- Social – there may be fewer accidents and less impact on local residents during construction.

Percentages of the development using innovative building methods – TBD.

Characteristic	No. of points available	Minimum standard
9.2 Building Adaptability	3	No

Intent

To encourage the development of buildings that are easily adaptable to meet the changing needs of current and future occupants.

Assessment Criteria

Demonstrate that a strategy has been developed which shows that internal and external elements within the building have been designed to allow for future adaptability.

Points

<i>New Build</i>	<i>Renovation / Fit-out</i>
There are no additional or different criteria to those outlined above specific to new build projects.	<p><i>Renovation</i> There are no additional or different criteria to those outlined above specific to renovation projects.</p> <p><i>Fit-out</i> There are no additional or different criteria to those outlined above specific to fit-out projects.</p>

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
A copy of the building designs, layouts and specifications that show the type of building construction to be used	Assessor's building/site inspection and photographic evidence confirming the design and layouts proposed have been realised.

Notes and References

Buildings are traditionally conceived as a rigid object with a configuration that is often fixed at the design stage. This model however is inflexible, unresponsive and unsustainable. By designing buildings to be easily adaptable for different occupants or alternative functions in the future it is possible to save energy and resources by reducing the need for new materials and the energy required to make them.

The following are examples of key design considerations that could be included within a strategy for an adaptable building:

- Storey height – of sufficient height to accommodate all proposed uses, yet low enough to avoid waste
- Building proximity, form and plot density
- Plan depth – the deeper the floor plate the more efficient the development will be (although need to take care not to compromise daylight). However in large developments a variety of floor plate depths will bring benefits of diversity when attracting potential tenants.
- Structural design – structural grid must ideally co-ordinate with all uses so that they are fully interchangeable without the need for significant transfer of structures or uneconomically long spans.
- Vertical circulation, servicing and core design – need to consider requirements for lifts and plant size and location
- Fire safety design – travel distance between stairs has impact on optimum floor plate efficiency.
- Layout of services and internal partitioning – consider implications of adding/removing partitions on services efficiency and optimum performance.

Characteristic	No. of points available	Minimum standard
9.3 Innovation	3	No

Intent

To provide design teams and projects the opportunity to achieve exceptional performance above the requirements set by SI 5281 'Sustainable Buildings' and/or innovative performance in categories not specifically addressed by SI 5281 'Sustainable Buildings'.

Assessment Criteria

Identify and document the intent of the proposed innovation characteristic, the proposed requirement for compliance, the proposed submittals to demonstrate compliance, and the design strategies that could be taken to meet the requirements.

Applications for the Innovation characteristic will be subject to approval by SII.

Each extra 3 points in Chapter 1 will be equal 1 additional point (and up to the maximum points awarded in this characteristic).

Extra points from other Chapters – TBD.

Points

<i>New Build</i>	<i>Renovation / Fit-out</i>
There are no additional or different criteria to those outlined above specific to new build projects.	<p><i>Renovation</i> There are no additional or different criteria to those outlined above specific to renovation projects.</p> <p><i>Fit-out</i> There are no additional or different criteria to those outlined above specific to fit-out projects.</p>

Evidence Required

<i>Stage A – Building Design</i>	<i>Stage B – Conformance of Performance</i>
<ul style="list-style-type: none"> • Provide: • A narrative statement of the characteristic intent • A narrative statement describing the credit requirements • Detailed narrative with quantifiable data describing the project's approach to achievement of the characteristic proposal • Copies of site plans, construction drawing, exhibits and/or photographs that will illustrate the project's approach to the credit • Provide relevant resources to substantiate the purpose and claims of the innovation. 	Documentation that confirms the project has achieved the innovation as described and quantified at the design stage.

Characteristic	No. of points available	Minimum standard
9.4 Using the Development as a Learning Tool	0	N/a

Not assessed in this Standard

Draft

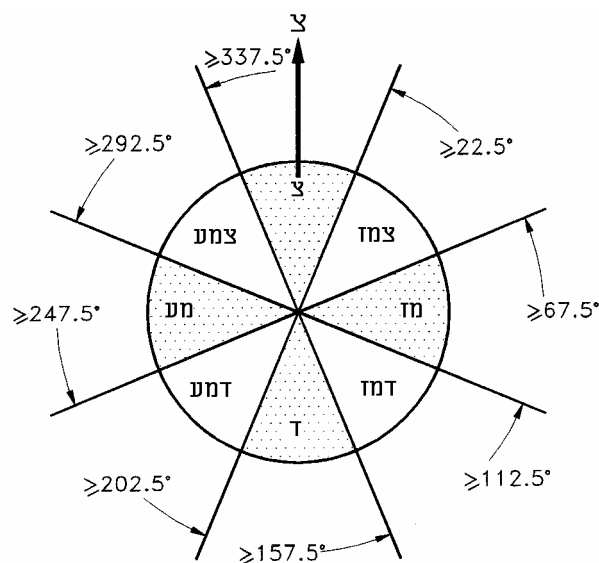
Appendix B

זכויות שמש

מבוא:

חשיפה לשמש חורפית חשובה הן עבור פנים הבנין והן עבור שטחי חוץ. חשיפת חלונות הבנין יכולה להפחית באופן משמעותי את צריכת האנרגיה לחימום. חשיפת שטחי חוץ ומדרכות משפיעה על תנאי נוחות תרמית בחורף, ע"י שיוצרת תנאי מיקרו אקלים שמאפשרים את השהייה בהם בחורף. בקיץ ניתן להצליל חלונות באמצעות תריסים, ושטחי חוץ באמצעות אמצעי הצללה דינמיים כגון: שמשיות או עצים נשירים. את השטחים המוצללים ממילא בחורף, ניתן להצליל ע"י אלמנטים קבועים.

תקן זה מתייחס לחשיפת חזיתות הבניין בכיוונים: מזרח, ד"מז, דרום, ד"מע ומערב (ראה ציור א') ולחשיפת השטחים הפתוחים.



ציור 1

הדרישות נקבעות לפי שתי רמות בהתאם לצפיפות נטו, כאשר הצפיפות מוגדרת כשטח רצפה בנוייה חלקי שטח המגרש.

רמה 1: רמה פחות מחמירה, כאשר הצפיפות היא 60% ומעלה (בטבלאות ובגרפים שבהמשך רמה זו תכונה מרכז).

רמה 2: רמה מחמירה יותר, כאשר הצפיפות היא מתחת ל-60% (בטבלאות ובגרפים שבהמשך רמה זו תכונה פריפריה).

דרישות החשיפה מוגדרות לפי:

1. רמת החשיפה הנדרשת:
 - a. מרכז (עבור צפיפות מעל 60%),
 - b. פריפריה (עבור צפיפות מתחת 60%).
2. מיקום האתר, באחד מאזורי האקלים בארץ:
 - a. אזור א': מישור החוף (מיוצג ע"י ת"א),
 - b. אזור ב': השפלה והעמקים (מיוצג ע"י באר שבע),

- c. אזור ג': אור ההר (מיוצג ע"י ירושלים),
 d. אזור ד': הבקעה והערבה (מיוצג ע"י אילת).

3. הפניית החזית:

- a. הגזרה הפונה למזרח,
 b. הגזרה הפונה לדרום מזרח,
 c. הגזרה הפונה לדרום,
 d. הגזרה הפונה לדרום מערב,
 e. הגזרה הפונה למערב.

דרישות החשיפה הנדרשות לפי הרמה:

1. חשיפת השטחים הפתוחים:
 a. מרכז: יש לחשוף 30% מהשטח הפתוח הציבורי לשמש החורפית.
 b. פריפריה: יש לחשוף 40% מהשטח הפתוח הציבורי לשמש החורפית.
 2. חשיפת מדרכות:
 a. מרכז: יש לחשוף 1מ' מהמדרכה לשמש החורפית.
 b. פריפריה: יש לחשוף 2מ' מהמדרכה לשמש החורפית.

קביעת הדרישות לחשיפת השמש נעשית עבור חודש דצמבר, שבו זווית השמש היא הנמוכה ביותר, ולכן המחמירה ביותר.

שיטות לשמירה על זכויות שמש:

מוצעות שלוש שיטות לבדיקת זכויות השמש:

שיטה א': קביעה בהתאם לכמות הקרינה הנדרשת על החלונות בחורף (גישה תפקודית) אחוז חשיפת החלונות לשמש החורפית הנדרש בהתאם לשתי רמות, נקבע עבור האורניטציות השונות ועבור ארבעת אזורי האקלים בישראל, בהתייחס לחומרת החורף ולחומרת הקיץ (שביב, קפלוטו ויזיאורו, 2002). בהתאם לאחוז זה מחושבת הקרינה הנדרשת בכיוונים השונים בשתי הרמות. החישוב מתבצע עבור חודש דצמבר (ראה טבלה 1). שיטה זו מתאימה לחשיפת חזיתות בניינים בלבד ולא עבור השטחים הפתוחים. בשיטה זו נדרשת הוכחת המתכנן לגבי השגת כמות הקרינה הדרושה.

	מזרח		דרום-מזרח		דרום		דרום-מערב		מערב	
	מרכז	פריפריה	מרכז	פריפריה	מרכז	פריפריה	מרכז	פריפריה	מרכז	פריפריה
תל-אביב	סה"כ	0.68	1.76	2.51	2.09	2.51	2.09	0.68	1.76	2.51
חשיפה (%)	30	50	40	60	50	70	40	60	30	50
נדרש	0.204	0.34	0.704	1.056	1.255	1.757	0.836	1.254	0.234	0.39
באר-שבע	סה"כ	0.7	1.81	2.59	1.94	2.59	1.94	0.7	1.81	2.59
חשיפה (%)	40	50	45	60	55	70	45	60	40	50
נדרש	0.28	0.35	0.8145	1.086	1.4245	1.813	0.873	1.164	0.328	0.41
ירושלים	סה"כ	0.7	1.81	2.59	1.94	2.59	1.94	0.7	1.81	2.59
חשיפה (%)	40	50	55	70	65	80	55	70	40	50
נדרש	0.28	0.35	0.9955	1.267	1.68	2.072	1.067	1.358	0.328	0.41
אילת	סה"כ	0.68	1.74	2.47	1.84	2.47	1.84	0.68	1.74	2.47
חשיפה (%)	30	50	30	50	30	50	30	50	30	50
נדרש	0.204	0.34	0.522	0.87	0.741	1.235	0.552	0.92	0.234	0.39

טבלה 1 – כמות הקרינה הדרושה (קווי"ש למ"ר), בהתאם לאחוזי החשיפה לשמש הנדרשים עבור ארבעת אזורי האקלים בישראל (בהתבסס על הקרינה בחודש דצמבר בכל אחד מאזורי האקלים).

שיטה ב': קביעה בהתאם לשעות (גישה תפקודית)

החשיפה לשמש נקבעת לפי שעות נתונות, שהן השעות הנדרשות להשגת כמות הקרינה כפי שנקבעה בטבלה 1 (ראה טבלה 2). גישה זו מתאימה לחשיפת חזיתות בניינים וכן לחשיפת שטחים פתוחים ומדרכות. בשיטה זו נדרשת הוכחת המתכנן לגבי שעות החשיפה לשמש.

Tel Aviv	Periphery		Center		Periphery		Center		Periphery		Center		Periphery		Center	
	Azim=90	sc 50	sc 30	Azim=135	sc 60	sc 40	Azim=180	sc 70	sc 50	Azim=225	sc 60	sc 40	Azim=270	sc 50	sc 30	
required	0.34	0.204	1.086	0.704	1.757	1.255	1.254	0.836	0.39	0.234						
December	9.30-11	10.30-11	10-13	11-13	10-14	10.30-13	10-13.30	10-12.30	12-14	12-13						
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7:00	0.04	0.04	0.05	0.05	0.03	0.03	0	0	0	0	0	0	0	0	0	
8:00	0.16	0.16	0.21	0.21	0.14	0.14	0	0	0	0	0	0	0	0	0	
9:00	0.23	0.23	0.36	0.36	0.28	0.28	0.01	0.01	0	0	0	0	0	0	0	
10:00	0.18	0.18	0.39	0.39	0.37	0.37	0.11	0.11	0	0	0	0	0	0	0	
11:00	0.07	0.07	0.33	0.33	0.4	0.4	0.22	0.22	0	0	0	0	0	0	0	
12:00	0	0	0.23	0.23	0.38	0.38	0.31	0.31	0.05	0.05	0	0	0	0	0	
13:00	0	0	0.14	0.14	0.33	0.33	0.37	0.37	0.21	0.14	0.14	0.14	0.14	0.14	0.14	
14:00	0	0	0.05	0.05	0.28	0.28	0.42	0.42	0.16	0.21	0.21	0.21	0.21	0.21	0.21	
15:00	0	0	0	0	0.2	0.2	0.39	0.39	0.22	0.22	0.22	0.22	0.22	0.22	0.22	
16:00	0	0	0	0	0.1	0.1	0.26	0.26	0.16	0.16	0.16	0.16	0.16	0.16	0.16	
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0.68	0.68	1.76	1.76	2.51	2.51	2.09	2.09	0.78	0.78						
required	0.265	0.16	1.09	0.71	1.77	1.268	1.27	0.84	0.41	0.25						
BEER SHEVA	Periphery		Center		Periphery		Center		Periphery		Center		Periphery		Center	
	Azim=90	sc 50/40	Azim=135	sc 70/55	Azim=180	sc 70/55	Azim=225	sc 70/55	Azim=270	sc 50/40	sc 50	sc 40	sc 50	sc 40		
required	0.35	0.28	1.086	0.8145	1.813	1.4245	1.164	0.873	0.41	0.328						
December	9.30-11	10-11	10-12.30	11-14	10-14	10.30-13.30	10.30-13.30	10-12.30	12-14	12-13.30						
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00	0.05	0.05	0.05	0.05	0.03	0.03	0	0	0	0	0	0	0	0		
8:00	0.17	0.17	0.22	0.22	0.14	0.14	0	0	0	0	0	0	0	0		
9:00	0.23	0.23	0.37	0.37	0.29	0.29	0.04	0.04	0	0	0	0	0	0		
10:00	0.18	0.18	0.4	0.4	0.38	0.38	0.14	0.14	0	0	0	0	0	0		
11:00	0.07	0.07	0.34	0.34	0.42	0.42	0.24	0.24	0	0	0	0	0	0		
12:00	0	0	0.24	0.24	0.39	0.39	0.31	0.31	0.05	0.05	0	0	0	0		
13:00	0	0	0.14	0.14	0.34	0.34	0.35	0.35	0.15	0.15	0.15	0.15	0.15	0.15		
14:00	0	0	0.05	0.05	0.29	0.29	0.36	0.36	0.22	0.22	0.22	0.22	0.22	0.22		
15:00	0	0	0	0	0.21	0.21	0.31	0.31	0.23	0.23	0.23	0.23	0.23	0.23		
16:00	0	0	0	0	0.1	0.1	0.19	0.19	0.17	0.17	0.17	0.17	0.17	0.17		
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	0.7	0.7	1.81	1.81	2.59	2.59	1.94	1.94	0.82	0.82						
required	0.365	0.25	1.17	0.77	1.82	1.53	1.15	0.905	0.42	0.31						
JERUSALEM	Periphery		Center		Periphery		Center		Periphery		Center		Periphery		Center	
	Azim=90	sc 50/40	Azim=135	sc 80/65	Azim=180	sc 80/65	Azim=225	sc 80/65	Azim=270	sc 50/40	sc 50	sc 40	sc 50	sc 40		
required	0.35	0.28	1.267	0.9955	2.072	1.68	1.358	1.067	0.41	0.33						
December	9.30-11	10-11	9.30-13	10.30-14	9-14	10-13.30	10-14	9-13	12-14	12-13.30						
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00	0.05	0.05	0.05	0.05	0.03	0.03	0	0	0	0	0	0	0	0		
8:00	0.17	0.17	0.22	0.22	0.14	0.14	0	0	0	0	0	0	0	0		
9:00	0.23	0.23	0.37	0.37	0.29	0.29	0.04	0.04	0	0	0	0	0	0		
10:00	0.18	0.18	0.4	0.4	0.38	0.38	0.14	0.14	0	0	0	0	0	0		
11:00	0.07	0.07	0.34	0.34	0.42	0.42	0.24	0.24	0	0	0	0	0	0		
12:00	0	0	0.24	0.24	0.39	0.39	0.31	0.31	0.05	0.05	0	0	0	0		
13:00	0	0	0.14	0.14	0.34	0.34	0.35	0.35	0.15	0.15	0.15	0.15	0.15	0.15		
14:00	0	0	0.05	0.05	0.29	0.29	0.36	0.36	0.22	0.22	0.22	0.22	0.22	0.22		
15:00	0	0	0	0	0.21	0.21	0.31	0.31	0.23	0.23	0.23	0.23	0.23	0.23		
16:00	0	0	0	0	0.1	0.1	0.19	0.19	0.17	0.17	0.17	0.17	0.17	0.17		
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	0.7	0.7	1.81	1.81	2.59	2.59	1.94	1.94	0.82	0.82						
obtained	0.365	0.25	1.305	0.97	2.11	1.675	1.4	1.08	0.42	0.31						
EILAT	Periphery		Center		Periphery		Center		Periphery		Center		Periphery		Center	
	Azim=90	sc 50/30	Azim=135	sc 50/30	Azim=180	sc 50/30	Azim=225	sc 50/30	Azim=270	sc 50/30	sc 50	sc 30	sc 50	sc 30		
required	0.34	0.204	0.87	0.522	1.235	0.741	0.92	0.552	0.39	0.234						
December	9.30-11	9-9.30	10.30-13	11-12	10.30-13	11-12	10.30-13	11-12	12-14	13-13.30						
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7:00	0.04	0.04	0.05	0.05	0.03	0.03	0	0	0	0	0	0	0	0		
8:00	0.16	0.16	0.21	0.21	0.14	0.14	0	0	0	0	0	0	0	0		
9:00	0.23	0.23	0.36	0.36	0.28	0.28	0.03	0.03	0	0	0	0	0	0		
10:00	0.18	0.18	0.38	0.38	0.36	0.36	0.13	0.13	0	0	0	0	0	0		
11:00	0.07	0.07	0.33	0.33	0.39	0.39	0.23	0.23	0	0	0	0	0	0		
12:00	0	0	0.23	0.23	0.37	0.37	0.29	0.29	0.05	0.05	0	0	0	0		
13:00	0	0	0.13	0.13	0.33	0.33	0.33	0.33	0.14	0.14	0.14	0.14	0.14	0.14		
14:00	0	0	0.05	0.05	0.27	0.27	0.34	0.34	0.21	0.21	0.21	0.21	0.21	0.21		
15:00	0	0	0	0	0.2	0.2	0.3	0.3	0.22	0.22	0.22	0.22	0.22	0.22		
16:00	0	0	0	0	0.1	0.1	0.19	0.19	0.16	0.16	0.16	0.16	0.16	0.16		
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	0.68	0.68	1.74	1.74	2.47	2.47	1.84	1.84	0.78	0.78						
required	0.365	0.16	0.88	0.56	1.27	0.76	0.915	0.52	0.4	0.245						

טבלה 2 – קביעת שעות החשיפה לשמש בהתאם לכמות הקרינה שנדרשה בטבלה 1, עבור ארבעת אזורים האקלים בישראל (הקביעה נעשית לפי חודש דצמבר)

שיטה ג': קביעה בהתאם לקווי המעטפת הסולרית (גישה תאורית)

שמירה על חתך המעטפת הסולרית, השומרת על החשיפה לשמש בשעות הנדרשות. החתך מוצג ע"י קו אלכסוני שנקבע לפי השעה המגבילה ביותר את גובה הבניין מבין שעות הבדיקה שנקבעו בטבלה 2 (ראה ציור 2). שיטה זו מיושמת עבור חשיפת חזיתות הבניינים, מדרכות ושטחים פתוחים.

יישום הגישה התיאורית:

1. **חשיפת חזיתות בניינים** - יש לבחור את קו החתך המתאים לפי האזור האקלימי, הפניית החזית והרמה הנדרשת (ראה ציור 3). יש למקם את נקודת ההתחלה של הקו בבסיס הקומה הראשונה של המגורים, או של חדרי המלון, או של חדרי אשפוז בבנייני בריאות, או של כיתות במבני חינוך.

2. **חשיפת מדרכות** – יש לבחור את קו החתך המתאים לפי האזור האקלימי והפניית החזית. יש למקם את נקודת ההתחלה של הקו במרחק 1 מ' או 2 מ' מבסיס הבניין בהתאם לרמה הנדרשת (מרכז או פריפריה) (ראה ציור 4).

3. **חשיפת שטחים פתוחים** – יש לבחור את קו החתך לדרום, לפי האזור האקלימי המתאים ולפעול בשלושה שלבים:

c. יש להגדיר משולש בגזרה הצפונית של השטח הפתוח בגודל של 30% או 40% מהשטח הפתוח לפי הרמה הנדרשת, כך שהצלע הארוכה שלו מקבילה לאלכסון השטח (ראה ציור 5).

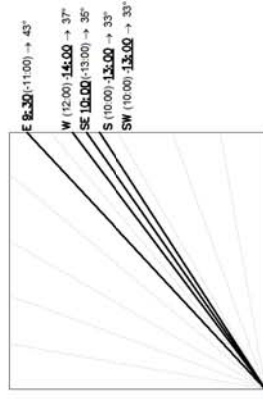
d. יש לקבוע את מיקום נקודת הבסיס במרכז היתר של המשולש. נקודת הבסיס היא נקודת ההתחלה של קו החתך הסולריים (ראה ציור 6).

e. יש להשתמש בקו החתך של הדרום עבור הבניינים המתוכננים בגזרה הדרומית, וכן עבור הבניינים במזרח ובמערב (ראה ציור 7).

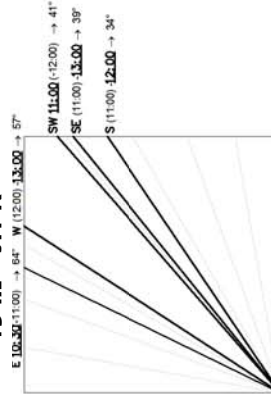
מקורות:

ע. שביב, י.ג. קפלוטו, א. יזיאורו, "תפקוד תרמי של בניינים ופיתוח קווים מנחים לתכנון מודע לאנרגיה" חלק ראשון: קווים מנחים לתכנון בנייני מגורים. מעבדת אקלים ואנרגיה בארכיטקטורה, הטכניון – מכון טכנולוגי לישראל. במימון משרד התשתיות הלאומיות – האגף למחקר ופיתוח. מרץ, 2002

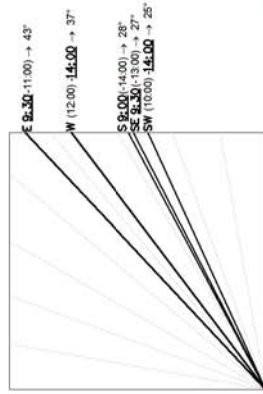
אילת - פריפריה



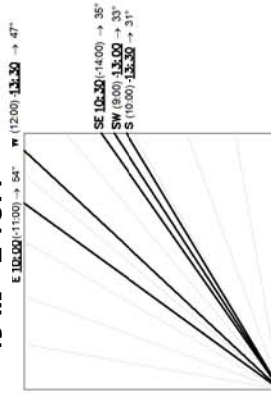
אילת - מרכז



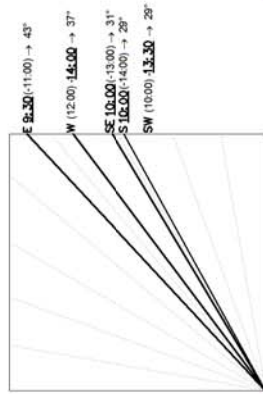
ירושלים - פריפריה



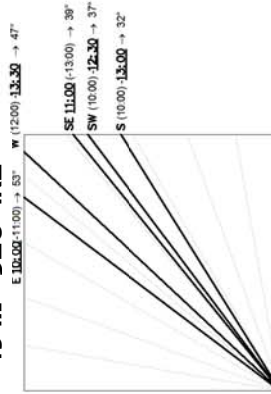
ירושלים - מרכז



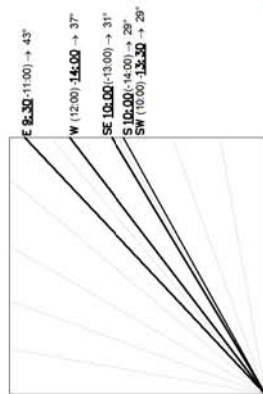
באר שבע - פריפריה



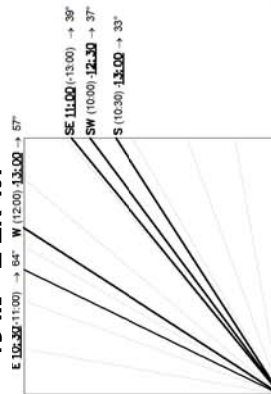
באר שבע - מרכז



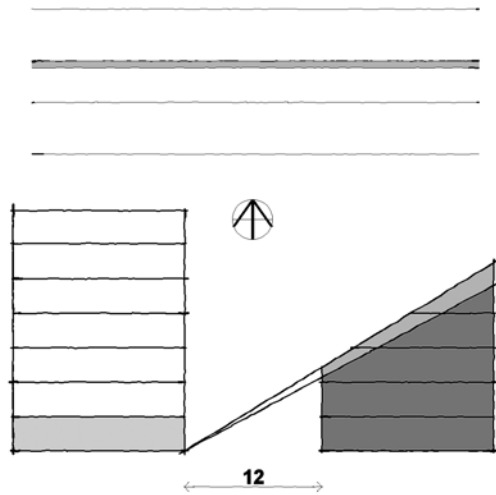
תל אביב - פריפריה



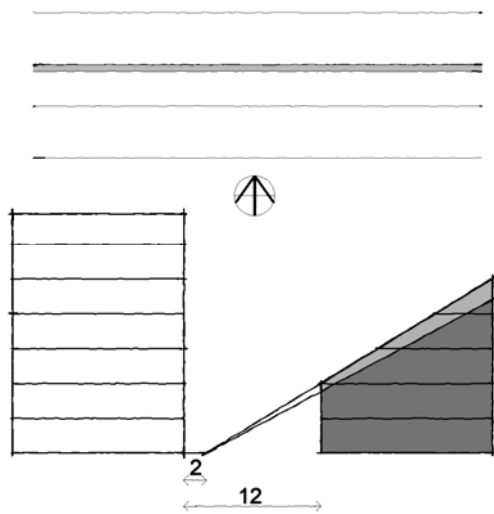
תל אביב - מרכז



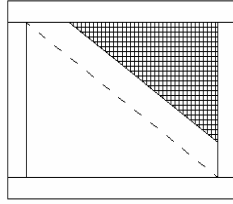
איור 2 – הזוויות המינימליות היוצרות את חתך המעטפת הסולרית לשמירה על זכויות שמש בהתאם לדרישה המשופרת (פריפריה), ולדרישה הבסיסית (מרכז), בארבעת אזורי האקלים בישראל. השעות המצוינות ליד כל קו, הן השעות הדרושות לחשיפה לשמש החורפית לפי הגישה התפקודית. השעה המצוינת עם קו תחתון, היא השעה הקריטית הקובעת את שיפוע הקו בגישה התיאורית



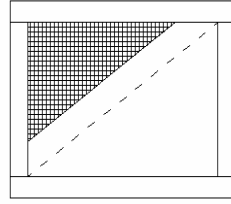
ציור 3- דוגמא לשימוש בקו החתך הסולרי לשמירה על חשיפת חזית דרומית של בניין שכן. המרחק בין הבניינים משני צידי הרחוב הוא 12 מ', והקומה הראשונה של הבניין משמשת למגורים.



ציור 4 – דוגמא לשימוש בקו החתך הסולרי לשמירה על חשיפת המדרכה הדרומית לשמש. המרחק בין הבניינים משני צידי הרחוב הוא 12 מ', ויש לחשוף 2 מ' מהמדרכה לשמש החורפית לפי הרמה הנדרשת לפריפריה (כפי שמוצג בציור), ו-1 מ' לפי הרמה הנדרשת למרכז.

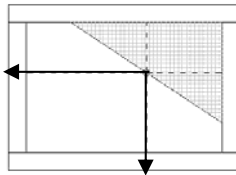


בניינים במערב ובדרום

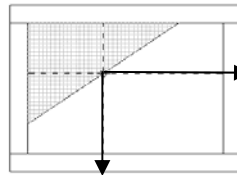


בניינים במזרח ובדרום

ציור 5 – חשיפת שטחים פתוחים לשמש – שלב 1 - קביעת השטח הדרוש לחשיפה בכיכר בהתאם לרמה הנדרשת: מרכז או פריפריה הדונומא מאינה שטוח של 30% המחאה למרז

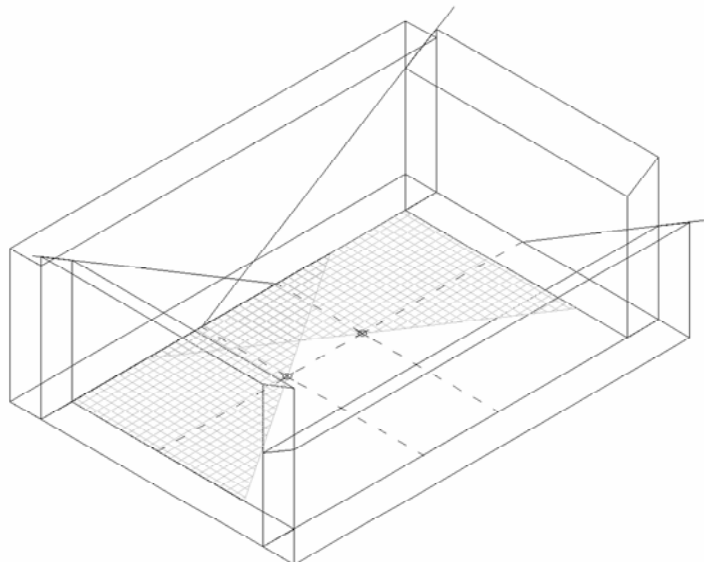


בניינים במערב ובדרום



בניינים במזרח ובדרום

ציור 6 – חשיפת שטחים פתוחים לשמש – שלב 2 - קביעת מיקום נקודת הבסיס במרכז היתר של המשולש, שמשמשת נקודת ההתחלה עבור כל בניין.



ציור 7 – חשיפת שטחים פתוחים לשמש – שלב 3 - יצירת המעטפת הסולרית באמצעות העברת הזוויות של הדרום מנקודות הבסיס עד לבניינים המתוכננים (דוגמא).

Appendix C:

רוח רצויה ובלתי רצויה

ניתוח רוחות באתר:

ניתוח הרוחות כולל הצגת כיווני הרוח המגיעה מהכיוון הראשי והמשני ואת מהירותה בגובה הולכי רגל, תוך בדיקת ההתאמה לסוג הפעילות המתוכנן ולתנאי הנוחות הרצויים. יש להבטיח עמידה בקריטריון מהירות הרוח המקסימלית המותרת, שמבחינה מיכנית מהווה רוח מסוכנת. במידה והמצב המתוכנן איננו עומד בקריטריונים של התאמת מהירות הרוח המומלצת לפעילויות השונות המוצעות בפרויקט, ניתן לבדוק את המצב הקיים ללא הפרויקט המוצע, ולהראות שהפרויקט המתוכנן איננו מרע את המצב הקיים.

נתוני רוחות:

נתוני הרוחות נמדדים בתחנות שונות ברחבי הארץ. הנתונים מוצגים באטלס האקלימי¹ בשני אופנים: גרף שושנת הרוחות וטבלת כיוונים ועוצמות של רוחות שליטות. הנתונים מוצגים עבור 8 שעות בארבעה חודשים המייצגים ארבע עונות שנה (ביתן, רובין, 1991):

1. חורף המיוצג ע"י חודש ינואר.
2. אביב המיוצג ע"י חודש אפריל.
3. קיץ המיוצג ע"י חודש יולי.
4. סתיו המיוצג ע"י חודש אוקטובר.

עוצמת הרוחות:

מהירויות הרוח המופיעות בנתוני הרוחות מתייחסות בד"כ למהירויות הרוח בשטח פתוח בגובה 10 מ'. מהירות הרוח תלויה בגובה ופרופיל תנאי השטח. ישנם ארבעה סוגי פרופילים:

1. שטח פתוח (open)
2. שטח כפרי (country)
3. שטח בנוי (urban)
4. שטח עירוני אינטנסיבי (city)

יש לתקן את מהירות הרוח בגובה הולכי הרגל בהתאם למהירות הרוח שנמדדה בשטח פתוח, לגובה תחנת המדידה ולפרופיל מקום הפרויקט. התיקון למהירות יעשה בהתאם לנוסחה 1.

$$\frac{V_H}{V_{met}} = \left(\frac{H}{H_{met}}\right)^a \quad \text{נוסחה 1:}$$

כאשר:

a	תנאי שטח	
0.33	נרכי זרים בהם בניינים מעל 7 קומות.	City
0.25	יישובים עירוניים, פרברים, יישובים ויישובים אדריים צפופים זה לזה קבוצה	Urban
0.20	יישוב פתוח עם מבצולים נפוצים לא גבוהים מ- 10 מ'.	Country
0.17	יישוב פתוח הייבש לרוב החורף הנוצף.	Open

V_H היא מהירות הרוח בגובה הרצוי

V_{MET} היא מהירות הרוח הנמדדת

H הוא הגובה הרצוי

H_{MET} הוא גובה תחנת המדידה

¹ ישנן תחנות מדידה של ארגונים כגון איגוד ערים לאיכות הסביבה, המנטרות מדידים שונים, ביניהם נתוני רוחות.

a הוא מקדם לפי הטבלה להלן:

התאמת מהירות הרוח לסוג הפעילות נעשה בהתאם לסקלת בופור (BRE, 1994).

סקלה זו מדרגת את מהירויות הרוח למספר דרגות עוצמה (ראה טבלא 1). בהתאם לסקלת בופור מוגדרת מהירות הרוח המומלצת לפעילויות שונות ואת השכיחות המקסימאלית המותרת לכל מהירות רצויה עד בלתי רצויה. כמו כן מוגדרת מהירות הרוח המקסימלית שמבחינה מיכנית מהווה רוח מסוכנת. מהירות מקסימלית זו שווה לכל סוגי הפעילויות (ראה טבלא 2).

דירוג בופור	תיאור	טווח מהירות הרוח הממוצעת (מ'ש') בגובה 10 מ'	השפעות
B0	רגוע	0-0.2	
B1	תנועת אויר	0.3-1.5	ללא רוח מורגשת
B2	רוח קלה	1.6-3.3	תחושת רוח על הפנים
B3	רוח נעימה	3.4-5.4	דגלים מתנפנפים
B4	רוח בינונית	5.5-7.9	אבק וניירות עפים, פריעת שיער, בגדים מתנפנפים
B5	רוח ערה	8.0-10.7	גבול הרוח הנסבלת
B6	רוח חזקה	10.8-13.8	קושי בשימוש במטריה, התנגדות מורגשת כנגד הגוף, הרוח שורקת.
B7	סף סערה	13.9-17.1	חוסר נוחות בהליכה, קושי בהליכה יציבה, שיער מתנפנף.
B8	סערה	17.2-20.7	קושי בהתקדמות, קושי בשליטה בהליכה, קושי רב בשמירה על יציבות בזמן משבים.
B9	סערה חזקה	20.8-24.4	משבי רוח מעיפים בני אדם, לא ניתן לעמוד מול הרוח, כאב אוזניים, כאב ראש, קושי לנשום, נזקים בסביבה – רעפים עפים, ענפים נשברים וכד', סכנה להולכי רגל.
B10	סופה	24.5-28.4	כמעט ולא קיים ביבשה. עצים נעקרים, נזק משמעותי למבנים.

טבלא 1 – סיכום השפעות הרוח על הולכי רגל, בהתבסס על דירוג בופור של עוצמת הרוח. מהירות הרוח בגובה אדם היא 75% ממהירות הרוח הנמדדת בגובה 10 מ'. הערכים העשורניים נובעים מתרגום המהירויות מהטבלאות המקוריות, שנתונות בערכי קשר (1 מ'ש' = 1.94 קשר).

נוחות יחסית				פעילות	
מסוכן	לא נעים	נסבל	רצוי	מקומות ליישום	הליכה מהירה
B8	B7	B6	B5	מדרכות	
B8	B6	B5	B4	פארקים, רחבות כניסה	טיול
B8	B5	B4	B3	פארקים, רחבות	עמידה/ישיבה
B8	B4	B3	B2	בתי קפה, תיאטרון רחוב	חשיפה ארוכה
פעם בשנה	פעם בחודש	פעם בשבוע		סביר אם מהירות הרוח מתרחשת פחות מאשר:	

טבלא 2 – קריטריונים לנוחות ובטיחות בהתאם לפעילויות שונות. הערכים נתונים בדירוג בופור, ומתייחסים לטמפרטורות מעל 10°C. בטמפרטורות נמוכות יותר, יש להפחית יחידת בופור אחת לכל ירידה של 20°C. גבול הסכנה זהה לכל הפעילויות.

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