This is rating tool is for piloting only. The formal use of this IS International Technical Manual must be approved by ISCA.

Feedback on IS International rating tool Design and As Built (Pilot) can be provided through the ISCA Website and will be fed into the Technical Manual and Scorecard through incremental updates.

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IS International Version 1.0 (Pilot)
September 2017

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### Category Index

- **Management Systems**
- **Procurement and Purchasing**
- **Climate Change Adaptation**
- **Energy and Carbon**
  - **Water**
  - **Materials**
  - **Discharges to Air, Land and Water**
    - **Land**
    - **Waste**
  - **Ecology**
- **Community, Health, Wellbeing and Safety**
- **Heritage**
- **Stakeholder Participation**
- **Urban and Landscape Design**
- **Innovation**
INTRODUCTION

Infrastructure can be defined as the structural elements of economy and society which allow for production and distribution of goods and services without themselves being part of the production process.

The term sustainable development is most commonly defined by “Our Common Future”, released by the Brundtland Commission, formerly the World Commission on Environment and Development in 1987,

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains two key concepts:

- the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

The World Bank states that “Sustainable development recognizes that growth must be both inclusive and environmentally sound to reduce poverty and build shared prosperity for today's population and to continue to meet the needs of future generations. It must be efficient with resources and carefully planned to deliver immediate and long-term benefits for people, planet, and prosperity."

It is important to understand that infrastructure is crucial to sustainability in both:

- Its role in configuring society and the way it functions
- The way infrastructure is planned, designed, constructed, operated and adapted

Infrastructure is such a vital part of the workings of society. It is all around us and involved in so many things that we do. Therefore, ensuring infrastructure is ‘done’ in a sustainable way is important for its contribution to sustainable outcomes and its symbolic role in a greater move towards sustainability.

Infrastructure sustainability links industry, communities and commerce, beyond regulatory standards and with better performance in regard to environmental, social and economic aspects. This improvement in delivery of services, community acceptance, reduced economic liabilities and improved environmental integrity will play a significant role in determining future prosperity.

By implementing infrastructure sustainability, infrastructure owners will look to benefit from the improved approvals process, which results when factors are included implicitly in the design. Similarly, cost savings over the long-term from reductions in carbon trading liabilities, extended asset life and improved attractiveness for investors, all improve the viability and success of infrastructure.

Over the next 15 years, the world will require about $90 trillion in new infrastructure – most of it in developing and middle-income countries. Making the right choices in favour of infrastructure that is climate resilient and locks in a low carbon development pathway is critical and urgent. Action now will avoid huge costs later. (World Bank 2017)

Infrastrucure Sustainability

Infrastructure sustainability can be defined as infrastructure that is designed, constructed and operated to optimise environmental, social and economic outcomes over the long term. The optimisation component is important as it reflects a ‘triple bottom line’ approach to decision making and performance measurement and it promotes doing more than simply minimising impacts. The long-term component is also important given that infrastructure assets often tend to last 50 to 100 or more years and therefore they need to be adaptable to global changes and to the changing needs of society over these timeframes.
AUTHORISATION AND DISCLAIMER

The Infrastructure Sustainability (IS) rating scheme has been developed by ISCA. The IS rating scheme evaluates sustainability initiatives and potential environmental, social and economic impacts of infrastructure projects and assets. It is intended for use by stakeholders, including design, construction and operation project team members, as a guide for sustainable design, procurement, construction and operation. The IS rating scheme is subject to further development.

The IS rating scheme has been developed with the assistance and participation of representatives from many organisations. The views and opinions expressed have been determined by ISCA and its Committees.

ISCA, the IS rating scheme, and all accompanying documentation together represent ISCA’s approved standard to improve the sustainability of infrastructure using established and/or advanced industry principles, practices, materials and standards.

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ISCA and the IS rating scheme are no substitute for professional advice. You should seek your own professional and other appropriate advice on the matters addressed by them.

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ISCA does not endorse any self-assessed ISCA rating achieved by the use of the IS rating scheme. ISCA offers a formal certification process; this service provides for independent third party review of points claimed to ensure all points can be demonstrated to be achieved by the provision of the necessary documentary evidence. The use of the IS rating scheme without formal certification by ISCA does not entitle the user or any other party, to promote any rating achieved.

The application of the IS rating scheme to any and all infrastructure projects and assets is
encouraged including to assess and improve the sustainable design, construction and operating attributes of such infrastructure projects and assets. No fee is payable to ISCA for such use, however formal recognition of the IS rating – and the right to promote same – requires the undertaking of the formal certification process which is offered by ISCA.

You agree and acknowledge that you are only authorised to proceed to use the IS rating tool on the basis described above.

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ACKNOWLEDGEMENTS

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ISCA

The Infrastructure Sustainability Council of Australia (ISCA) is a member-based not-for-profit public and private industry council. ISCA is the peak industry body for advancing sustainability outcomes in infrastructure. ISCA’s mission is ‘Improving the productivity & liveability of industry & communities through sustainability in infrastructure’.

ISCA specialises in the facilitation and development of industry led performance based integrated triple-bottom-line governance and reporting frameworks, decision tools and rating tools; generating communities of practise throughout the lifecycle from funding, planning, procurement, design and delivery to operations and maintenance.

The means by which ISCA is advancing sustainability outcomes in infrastructure is through the development and facilitation of the IS rating scheme. IS rating scheme is an industry-compiled voluntary sustainability performance system, guiding, supporting and evaluating the planning, design, construction and operation of all infrastructure asset classes in all sectors linking industry, communities and commerce beyond regulatory standards. Since launching in 2012, over $82 billion in infrastructure and civil works projects or assets across Australia and New Zealand have either been certified or registered for an IS rating. The IS rating scheme is Australia’s only comprehensive rating scheme for evaluating sustainability across design, construction and operation of infrastructure. The IS International rating tool V1.0 Design and As Built (Pilot) expands this rating scheme and provides the platform to encourage and evaluate infrastructure sustainability across both Developing Countries and Developed Countries.

The idea behind ISCA was sparked in February 2007, when a presentation was given to Engineers Australia by David Hood and Glenn Hedges titled “Does Australia Need an Environmental Rating Scheme for Non-Building Projects”. This generated industry interest such that in the following March, a Steering Committee was formed which:

- Nominated scheme boundaries and scope
- Decided to conduct an investigation into other similar schemes and tools in existence locally and internationally to prevent duplication of efforts
- Acted as an “epi-centre” for scheme initiation

The Steering Committee members were unable to find a similar tool or group developing such a scheme and agreed that stakeholder input and support would be essential if a scheme was to be developed. The committee developed a business case and on 28 February 2008, the Australian Green Infrastructure Council (AGIC) was launched at Queensland’s Parliament House as “Open for Membership”.

During the months of May through August 2008, AGIC was registered as a business, a constitution was prepared and a draft framework for a rating tool was completed. October 2008 saw Doug Harland appointed as AGIC’s first CEO and Antony Sprigg from GHD was engaged as the Tool Development Project Manager.

In November 2008, development of the rating tool commenced with the first round of Pilot Trials in August 2011 and the second round in October. Successful completion of these Pilot Trials saw the Tool finalised and launched nationally

For more details, see www.isca.org.au
BACKGROUND-IS INTERNATIONAL V1.0 DESIGN AND AS BUILT (PILOT)

The Need

ISCA developed the IS rating tool v1.0 Design and As Built through a rigorous process of authorship, review and trialling over several years. Category authors’ were engaged as experts in their particular fields, to develop the content of each of the rating tool categories. For each of the categories there was also an expert peer reviewer who reviewed the category author work at specific milestones. The whole process was also overseen by a Global Review Panel of seasoned industry experts who also conducted milestone reviews. The category author work was complete by June 2011 and the pilot tool was ready for trialling.

The scheme was launched on 29 February 2012 in Parliament House in Canberra by the Minister for Infrastructure and Transport, The Hon. Anthony Albanese.

To ensure continuous improvement, ISCA is always collecting feedback from registered and certified ratings, member working groups and other stakeholders in the industry. By late 2015, it was evident that the IS rating scheme was ready for an update to incorporate this feedback. The IS rating scheme scope was broadened, Version 1.2 Design and As Built was developed and IS Operation rating, already available in ‘Pilot’, was evolved to ‘version 1’. Since then, these rating tools have kept evolving with v2 design and As Built underway and Operations v1.2 recently launched.

The success of the IS rating tool in Australia led to the development of the IS rating tool for New Zealand.

It became evident very quickly that the IS rating tool was transforming the industry in Australia and New Zealand and was raising the bar for sustainability performance nationally. Through industry feedback and following the identification of some international drivers for change, ISCA identified the need for an IS tool which could be applied internationally.

This international Tool will help meet this challenge and ensure infrastructure is designed, constructed and operated to optimise environmental, social, economic and governance outcomes

Developing International Pilot V1.0

To develop the International Tool, the existing v1.2 Design and As Built Tool was used and adapted for international context. ISCA engaged with industry experts to develop this Pilot tool. The development process was as follows:

1. Comparative review of the IS rating tool Design and As Built against standards and benchmarks through South-East Asia which included:
   a. Consultation with key stakeholders from within China, Indonesia, Japan, Taiwan and the Philippines. on the international conversion of the tool from a process perspective to propose possible engagement models for different stakeholder types.
   b. Consultation with various international technical specialists to develop guidance to adapt the technical credits of the IS Rating Tool.
   c. Conducting background research into global rating tools and international standards to identify gaps.

2. Review of the comparative analysis and further research to develop the draft Technical Manual and scorecard

3. Development of additional or alternative credits to address issues related to Developing Countries

4. External peer review of the Draft Technical Manual by Australian and international independent industry experts

5. Challenge workshops with strategic stakeholders to test assumptions

6. Finalisation of the Technical Manual and Scorecard, based on feedback from the peer review and workshop

The objective was to develop an international tool which is:
- An adjustment based on ISv1.2 Design and As Built and where available makes use of IS V2 Design and As Built credit modifications.
- Robust and maintains the IS rating scheme core principles (third party assured, beyond BAU, evidence based, etc.)
- Flexible, can be applied to any region or Country, and can easily be adapted for the local context
- Easy to use and cost effective while still demonstrating leadership in infrastructure sustainability
- Creates or improves sustainable infrastructure expertise capacity and traction within the broader industry

This Technical Manual represents the Pilot launch of IS International. Key changes have been made in the:

- Registration process
- Materiality weightings assessment provided for Developed Countries and Developing Countries (see "Definitions" for Developed and Developing Countries definition)
- Technical Manual for certain credits contains requirements for Developed Countries and Developing Countries
- Online technical manual with materiality weightings assessment scorecard and credit scorecard for Developed Countries and Developing Countries
- Online repository for approved international and national standards
- Updated verification process

In the meantime, work continues on IS International rating tool Version 1.0 Design and As Built, following IS International Pilot project trials commencing 2017.

See the ISCA website for more details.
SDG MAPPING

The IS rating scheme has a direct relationship with the 17 United Nations Sustainable Development Goals and can be used as a performance framework to measure and report against each goal. Countries are also encouraged to use the SDG Country Index to address issues where the SDG Index score for this Country is low.

The following provides a high level mapping of 17 United Nations Sustainable Development Goals to the 15 ISCA Credit Categories, SDG 1 to 6:

1. **Goal 1:** End poverty in all its forms everywhere
   - ISCA Registration Form
   - Human Rights and Corporate Values

2. **Goal 2:** End hunger, achieve food security and improved nutrition and promote sustainable agriculture
   - ISCA Registration Form
   - Human Rights and Corporate Values

3. **Goal 3:** Ensure healthy lives and promote well-being for all at all ages
   - Man Management Systems
   - Community, Health, Wellbeing and Safety

4. **Goal 4:** Ensure inclusive and quality education for all and promote lifelong learning
   - Man Management Systems
   - Water

5. **Goal 5:** Achieve gender equality and empower all women and girls
   - ISCA Registration Form
   - Human Rights and Corporate Values

6. **Goal 6:** Ensure access to water and sanitation for all
   - ISCA Registration Form
   - Human Rights and Corporate Values
   - Discharges to Air, Land and Water
The following provides a high level mapping of 17 United Nations Sustainable Development Goals to the 15 ISCA Credit Categories, SDG 7 to 12:

<table>
<thead>
<tr>
<th>Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all</th>
<th>Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all</th>
<th>Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation</th>
<th>Goal 10: Reduce inequality within and among countries</th>
<th>Goal 11: Make cities inclusive, safe, resilient and sustainable</th>
<th>Goal 12: Ensure sustainable consumption and production patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ene</strong> Energy</td>
<td><strong>Man</strong> Management Systems</td>
<td><strong>ISCA</strong> Registration Form Human Rights and Corporate Values</td>
<td><strong>ISCA</strong> Registration Form Human Rights and Corporate Values</td>
<td><strong>Urb</strong> Urban and Landscape Design</td>
<td><strong>Her</strong> Heritage</td>
</tr>
<tr>
<td><strong>Mat</strong> Materials</td>
<td><strong>Pro</strong> Procurement and Purchasing</td>
<td><strong>Inn</strong> Innovation</td>
<td><strong>Man</strong> Management Systems</td>
<td><strong>Hea</strong> Community, Health, Wellbeing and Safety</td>
<td><strong>Was</strong> Waste</td>
</tr>
<tr>
<td><strong>Sta</strong> Stakeholder Participation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The following provides a high level mapping of 17 United Nations Sustainable Development Goals to the 15 ISCA Credit Categories, SDG 13 to 17:

<table>
<thead>
<tr>
<th>Goal 13: Take urgent action to combat climate change and its impacts</th>
<th>Goal 14: Conserve and sustainably use the oceans, seas and marine resources</th>
<th>Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss</th>
<th>Goal 16: Promote just, peaceful and inclusive societies</th>
<th>Goal 17: Revitalize the global partnership for sustainable development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haz Natural Hazards and Adaptions</td>
<td>Dis Discharges to Air, Land and Water</td>
<td>Lan Land</td>
<td>ISCA Registration Form</td>
<td>Inn Innovation</td>
</tr>
<tr>
<td>Eco Ecology</td>
<td>Sta Stakeholder Participation</td>
<td>Human Rights and Corporate Values</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IS RATING TOOL

What is ‘IS’?

‘IS’ stands for ‘Infrastructure Sustainability’. The IS rating scheme for infrastructure is developed and administered by the Infrastructure Sustainability Council of Australia (ISCA).

The IS rating scheme aims to:

- Provide a common international language for sustainability in infrastructure
- Provide a vehicle for consistent application and evaluation of sustainability in tendering processes
- Help in scoping whole-of-life sustainability risks for projects and assets, enabling smarter solutions that reduce risks and costs
- Foster resource efficiency and waste reduction, reducing costs
- Foster innovation and continuous improvement in the sustainability outcomes from infrastructure
- Build an organisation’s credentials and reputation in its approach to sustainability in infrastructure

The IS rating scheme provides industry with a means to voluntarily assess performance, and to be recognised for good performance. The assessment is facilitated by using the IS rating scheme which consists of this Technical Manual and the Scorecard (downloadable from www.isca.org.au).

The scheme builds on current guidance and practices by providing industry with an incentive and protocol for assessing, benchmarking and ‘labelling’ the sustainability performance of infrastructure projects or assets at the planning & design, construction and/or operations phases.

Who can use the IS rating scheme?

The IS rating scheme can be used to assess the sustainability credentials of infrastructure. ISCA encourages all industry stakeholders, globally, to use the tool, e.g. developers, designers, planners, legislators, constructors, operators, owners etc.

A single rating can be obtained for infrastructure projects or assets that include more than one infrastructure type while large projects which are packaged into multiple smaller projects may obtain multiple ratings.

A formal certification from ISCA is necessary for the user or any other party to promote the IS rating achieved.

Purpose

In essence, the scheme:

- Allows for the registration of and supports applicants seeking ratings for implementing sustainable infrastructure designs and practices
- Provides guidance for undertaking an assessment of the infrastructure performance against a number of credits that relate to specific sustainability categories
- Provides the functions for certifying ratings based on independent verification of submitted assessments
- Facilitates the issuing of different levels of rating that reflect a project/asset's performance against the set benchmarks for sustainable delivery and operation

Infrastructure Types

The scheme covers the methodology required to secure a rating for a range of infrastructure types as described in Figure A. Note that infrastructure which is used in the resource sector (e.g. rail lines for transporting minerals) is eligible for rating by the IS rating scheme. There may be other infrastructure types that do not fall clearly into one or other of the types in the figure. Where this is the case, please contact ISCA to discuss applicability.
Figure A: Infrastructure types covered by the IS rating scheme (adapted from Department of Infrastructure and Transport, 2012)

<table>
<thead>
<tr>
<th>Transport</th>
<th>Utilities</th>
<th>Public Realm/Open Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Road</td>
<td>Water</td>
<td>Sports</td>
</tr>
<tr>
<td>Port</td>
<td>Communication</td>
<td>Defence</td>
</tr>
<tr>
<td>Rail</td>
<td>Energy</td>
<td>Parks</td>
</tr>
<tr>
<td>Airport</td>
<td>Waste</td>
<td>Detention</td>
</tr>
</tbody>
</table>
Ratings Types

ISCA recognises that sustainable outcomes on a project or asset are achieved by the collective input, effort and drive of a range of key stakeholders across the various project or asset phases. In recognition of this, the IS rating scheme rates infrastructure based on performance at the milestones in Figure B.

Figure B: IS Rating Types

<table>
<thead>
<tr>
<th>Rating Type</th>
<th>When can this be applied for?</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>End of Planning and Design</td>
<td>May be awarded based on the inclusion of design elements and construction requirements for sustainability in the project documentation. The rating may be awarded after completion of design. This is an 'interim' rating and must be replaced by an As Built rating after construction.</td>
</tr>
<tr>
<td>As Built</td>
<td>End of Construction</td>
<td>May be awarded for the inclusion of design elements, and construction requirements for sustainability in the project documentation along with the measured sustainability performance during construction and built into the infrastructure asset. The rating may be awarded after practical completion of the project. This rating supersedes the Design rating.</td>
</tr>
<tr>
<td>Operation</td>
<td>During Operation</td>
<td>May be given any time during operation. The Operation rating is based on the measured sustainability performance of the operating infrastructure asset. There is no requirement for the infrastructure asset to have achieved either a Design rating or an As Built rating to achieve an Operation rating. Existing infrastructure assets in operation are eligible to apply for an Operation rating. The Operation rating must be revalidated every five years.</td>
</tr>
</tbody>
</table>

The timing of the ratings is shown in Figure C.

This version of IS International is for Design and As Built only.

What and who gets the Rating?

The certified rating is awarded to the defined infrastructure project or asset itself. The registrants for the rating must be one or more of the key stakeholders in the project or asset. Key stakeholders typically include proponents (clients), owners, operators, designers, and constructors. Following achievement of certification, applicants will be able to publicly claim an IS rating for the infrastructure and potentially obtain the following benefits:

- Gaining local and international market recognition as a sustainability leader in the infrastructure industry
- Establishing a competitive commercial advantage by using the project or asset as a reference when tendering for future projects
- Validating the achievement through third party verification
**Figure C:** Infrastructure stages and IS rating types

**Scheme Framework**

The infrastructure project or asset is assessed in terms of how it performs in each of fifteen categories that are grouped into six themes in infrastructure sustainability. These are outlined in Figure D.

**Figure D:** Rating Scheme Framework

<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories</th>
<th>Abbreviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management &amp; Governance</td>
<td>Management Systems</td>
<td>Man</td>
</tr>
<tr>
<td></td>
<td>Procurement &amp; Purchasing</td>
<td>Pro</td>
</tr>
<tr>
<td></td>
<td>Natural Hazards</td>
<td>Haz</td>
</tr>
<tr>
<td>Using Resources</td>
<td>Energy &amp; Carbon</td>
<td>Ene</td>
</tr>
<tr>
<td></td>
<td>Water</td>
<td>Wat</td>
</tr>
<tr>
<td></td>
<td>Materials</td>
<td>Mat</td>
</tr>
<tr>
<td>Emissions, Pollution &amp; Waste</td>
<td>Discharges to Air, Land &amp; Water</td>
<td>Dis</td>
</tr>
<tr>
<td></td>
<td>Land</td>
<td>Lan</td>
</tr>
<tr>
<td></td>
<td>Waste</td>
<td>Was</td>
</tr>
<tr>
<td>Ecology</td>
<td>Ecology</td>
<td>Eco</td>
</tr>
<tr>
<td>People &amp; Place</td>
<td>Community Health, Wellbeing &amp; Safety</td>
<td>Hea</td>
</tr>
<tr>
<td></td>
<td>Heritage</td>
<td>Her</td>
</tr>
<tr>
<td></td>
<td>Stakeholder Participation</td>
<td>Sta</td>
</tr>
<tr>
<td></td>
<td>Urban &amp; Landscape Design</td>
<td>Urb</td>
</tr>
<tr>
<td>Innovation</td>
<td>Innovation</td>
<td>Inn</td>
</tr>
</tbody>
</table>
IS rating scheme

The IS rating scheme is the overall system for measuring, assessing and rating the sustainability performance of infrastructure projects and assets. It comprises:

- The IS rating tools
- The rating process
- ISCA education and training programs (including the IS Accredited Professional program).

IS rating tools included under the IS rating scheme are:

1. IS rating tool Version 1.0 (2012)
2. IS rating tool Version 1.2 Design and As Built (May 2016)
3. IS rating tool Version 1.2 Operations (February 2017)
4. IS International rating tool Pilot V1.0 Design and As Built (August 2017)

IS International rating tool v1.0 Design and As Built (Pilot)

The IS International rating tool v1.0 D&AB (Pilot) is the tangible part of the scheme, used to undertake an assessment on projects outside of Australia and New Zealand. It comprises:

- IS International D&AB rating process
- IS International D&AB Scorecard:
  - Weightings assessment
  - Rating tool scorecard
- IS Materials Calculator - a calculator used to measure performance in the Materials category
- Various guidelines – that support the application of the tool

Categories and Credits

Each category is divided into a number of credits each of which addresses a specific aspect of sustainability performance within the category. This may relate to a mitigation or improvement initiative, or a process that supports achievement of sustainable outcomes.

Some credits may not be applicable to all rating types. Each credit has a reference which is a three letter abbreviation based on the category name and then a sequential number.

Each credit has a title and an aim which describes what the credit is trying to reward or encourage.

Each credit:

- Has a series of benchmark performance levels which define increasing levels of performance for that credit from Level 1 to Level 3
- The three levels approximately correspond to ‘Commended’, ‘Excellent’ and ‘Leading’ performance. Note that all benchmark levels are intended to reflect ‘beyond business as usual’ performance.
- In some cases, not all of the three levels are used.
- Requires evidence to demonstrate that a certain performance benchmark (Level) is being met. Note that the evidence listed in the IS rating tool are only a guide and the Assessor must determine what is the best evidence to demonstrate benchmark achievement.
- For some credits, developing countries have the option to use alternative benchmarks or different credit pathway. This is clarified within each relevant credit.

Scoring

Each credit has a weighting shown as the ‘score possible’. The ‘points per level’ is the ‘score possible’ divided by the highest level available for that credit. Similarly, the ‘points achieved’ is the ‘points per level’ multiplied by the ‘level achieved’ (as assessed and/or verified).

Each credit weighting reflects the credit’s importance and therefore its relative contribution to the sustainability performance of the overall project or asset. Credit weightings are adjusted from a default set of weightings based on a weightings assessment. The weightings assessment may retain, lower or raise the weighting of each credit based on how material or important it is to the overall sustainability performance of the asset. Credits whose weightings fall to zero or below a
materiality threshold are ‘scoped out’. The default weightings were determined through a weighting survey and study as part of the original scheme development.

The category score is simply the sum of the ‘points achieved’ for each credit and the overall score is simply the sum of the category scores on a 100-point scale.

The rating level is assigned based on the overall score as shown in Figure E.

**Figure E: Rating Levels**

<table>
<thead>
<tr>
<th>Score</th>
<th>Rating Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 25</td>
<td>Not eligible to apply for a certified rating</td>
</tr>
<tr>
<td>25 to &lt;50</td>
<td>Commended</td>
</tr>
<tr>
<td>50 to &lt;75</td>
<td>Excellent</td>
</tr>
<tr>
<td>75 to 100</td>
<td>Leading</td>
</tr>
</tbody>
</table>
Guide to the Credits

Within the ‘Assessment Credits’ section of this Technical Manual, guidance on each credit is laid out as follows:

**Ref-x Credit Title**

Each credit has a reference which is a three-letter abbreviation based on the category name and then a sequential number.

Each credit has a simple credit title.

**Aim**

The aim of the credit – “To reward…”. Each credit has an aim which describes what the credit is trying to reward or encourage. This is the intent of the credit.

**Criteria**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 benchmark – describes the requirements a project or asset needs to meet to achieve Level 1 performance. This is the lowest level of performance that receives any score.</td>
<td>Level 2 benchmark - describes the requirements a project or asset needs to meet to achieve Level 2 performance.</td>
<td>Level 3 benchmark - describes the requirements a project or asset needs to meet to achieve Level 3 performance. This is the highest level of performance and thus receives the highest score.</td>
<td></td>
</tr>
<tr>
<td>Level 1 evidence – the suggest evidence that may be used to demonstrate the benchmark performance level has been achieved.</td>
<td>Level 2 evidence</td>
<td>Level 3 evidence</td>
<td></td>
</tr>
</tbody>
</table>

Guidance specific to Developing Countries will be shown in boxes.

**Benchmarks**

Each credit has a series of benchmark performance levels which define increasing levels of performance for that credit typically from Level 1 to Level 3. The three levels approximately correspond to ‘commended’, ‘excellent’ and ‘leading’ performance. Note that all benchmark levels are intended to reflect ‘beyond business as usual’ performance. In some cases, not all of the three levels are used.

Some credits are ‘scaled’, that is the points achieved vary with a measure of improvement rather than having three fixed levels. Scaled credits are noted and the scaling process is explained in the credit details. Scaled credits encourage the pursuit of every improvement opportunity possible.

**Evidence**

Evidence is required for each credit to demonstrate that a certain performance benchmark (Level) is being met. Note that the evidence listed in the IS rating tool is only a guide and the Assessor must determine the best evidence to demonstrate benchmark achievement.
It is recognised that project or asset management accountability and structures often change during the life of a project or asset. Evidence should be provided to cover the duration of the relevant rating phases. For example, for the As Built rating, evidence should cover the design phase and the construction phase (a number of documents are acceptable as long as there is continuous coverage).

Additional Guidance

This section provides additional information to help the Assessor to determine the appropriate level achieved and the evidence needed to demonstrate that achievement. Note that where the word ‘must’ is used, this refers to a requirement for achievement of a benchmark level, whereas the word ‘should’ is more of a general guidance.

Scaled Credits

Certain credits in the IS rating tool have been made ‘scaled credits’. This means that rather than just three fixed Levels and therefore scores being achievable, fractions of scores are achievable on a sliding scale. This approach encourages pursuit of every incremental improvement possible. The scaled credits are Ene-1, Wat-1, Wat-2, Mat-1, Lan-1, Was-3 and Eco-1.

The Level for scaled credits is determined on a sliding scale either from 0 to Level 3 (full points) or in some cases from Level 1 to Level 3. For every unit of performance improvement up to Level 3, fractions of Levels may be achieved on a sliding scale.

For example, for the Ene-1 credit, Level 1 simply requires measurement of GHG footprint (no reduction) whereas Level 3 requires a 30% reduction in GHG emissions compared to the Base Case. Therefore, a 10% reduction would achieve Level 1 + (10% / 30%) x (3 - 1) = Level 1.67. This decimal Level is simply entered into the scorecard which then calculates the points achieved for the credit by multiplying the Level Achieved by the Points Per Level.

Where a project can demonstrate a substantial improvement above the Level 3 performance, then it may be eligible for Innovation points. As a guide, the credit Level 3 benchmark would need to be exceeded by at least a similar magnitude as the performance increment between Level 2 and Level 3.

For small projects, some credits provide guidance that allows a streamlined approach, whereby some criteria are removed. In these cases, a small project may be able to achieve a substantial improvement on the top Level small project benchmark by achieving the original (‘large project’) top Level benchmark.

See each of the scaled credits for more specific guidance.

Materiality Guidance

For some credits, the Materiality Score is used to guide the credit application. For example, in some cases if Materiality is low (i.e. Materiality score of 1) then some of the credit criteria may not apply. This helps to simplify some of the credits on a materiality (risk) basis.

Small Project Guidance

Specific consideration was given to streamlining the scheme for ‘Small Projects’. This included analysing the credits using a ‘Small Project lens’ and engaging with some Small Project stakeholders. The result is that many of the credits have specific guidance for Small Projects highlighted in grey boxes for easy reference. ‘Small Projects’ are defined as those with a capital value of less than or equal to $20 million.

The IS rating tool Scorecard

The IS rating tool scorecard (Excel spreadsheet) facilitates self-assessment. Refer to the Instructions tab for details.

The IS Materials Calculator

The IS Materials Calculator evaluates environmental impacts in relation to use of materials on infrastructure projects and assets. It should be used in conjunction with the Mat-1 credit in the Materials Category of the IS rating tool.

Support Tools and Materials

Various tools and materials are provided by ISCA and others to support the IS rating tool.
Some of these are developed by ISCA and further tools and materials may be developed in the future such as guides to certain aspects of assessment. The current support tools and materials available from ISCA include:

**The IS Materials Calculator Guidelines**

As the name suggests, this guide explains the methodology behind the IS Material Calculator in the Materials Category.

**The IS International Design Review Guide**

This guide provides guidance, in addition to the guidance provided in the Technical Manual, for those applying the Urb-1 credit in the Urban and Landscape Design Category and refers specifically to the requirement for a design review.

**The IS Marketing Guide**

The IS Marketing Guide will provide you with information on how you can successfully market your IS ‘registration to pursue’ and ‘certification of’ an IS rating.

**ISCA Guidance Repository**

The online Guidance Repository includes ISCA approved Standards and Guidelines that can be used by the ISCA Assessor and the project team for the Credit submission. Its purpose is to provide an up to date and dynamic references for all projects. This will be updated regularly as feedback from the industry and registered projects is received.

This Guidance is provided for each credit and within each credit the following is included:

- Internationally approved Standard and Guidelines: These can be used by any project internationally
- Country specific approved Standards and Guidelines: These can be used by the country they are listed under. Other Countries could use these references as well following discussion and approval by ISCA.

If a local standard exists and it is not included in the Repository, project teams are invited to use those following discussion and approval by ISCA.

**Updating the IS Rating Tool**

The rating scheme will be updated to reflect new information, practices, tools and references. The scheme will also be updated on the basis of stakeholder feedback.

**Feedback on the IS rating scheme**

ISCA encourages feedback on the rating scheme. Please provide feedback to info@isca.org.au.
THE IS INTERNATIONAL PILOT RATING PROCESS

There are four main stages in the IS International Pilot rating process as outlined in Figure A.

Figure A: Rating Process

This rating process has been adjusted for application to the IS International Pilot projects.

Figure B: Key Roles

<table>
<thead>
<tr>
<th>Roles</th>
<th>Responsibilities</th>
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</table>
| Assessor             | The Assessor is the primary contact person on the project/asset management team who liaises with ISCA during the rating process and is ultimately responsible for organising and submitting all evidence and documentation required to complete the self-assessment.  

It is recommended that this person be an IS Accredited Professional. |
| Case Manager         | The Case Manager is an ISCA staff member assigned to the project/asset once they complete the Registration stage of the rating process. The Case Manager is the first point of the contact for the Assessor, facilitates the kick off workshop and undertakes quarterly audits of the IS rating progress. |
| Case Manager Proxy   | The Case Manager proxy is appointed by the project team and is not an ISCA staff member. They may be an internal member of the project team or could be an appointed consultant. They may perform multiple functions for the project and do not need to be independent.  

The Case Manager proxy must be approved as appropriate by ISCA.  

They should have appropriate qualifications to provide rating tool and other technical support to the Assessor and other members |
of the project/asset management team throughout the rating process.

They must be a current IS Accredited Professional and must maintain their membership in the ISAP program throughout delivery of the rating.

### Verifiers

ISCA maintains a panel of Verifiers for appointment to registered IS ratings. Verifiers are independent specialists who are assigned to projects/assets during the Assessment stage to provide independent verification of the weightings assessment and Base case proposal, and the self-assessment.

### Technical Specialists

ISCA maintains a panel of Technical Specialists who can be used by ISCA as required to address technical queries and issues.

### Technical Steering Committee

The Technical Steering Committee is a sub-committee of the ISCA Board. They govern the rating process and are primarily responsible for certifying the achievement of a rating at either ‘Commended’, ‘Excellent’ or ‘Leading’ performance level, providing governance of tool development projects, and reviewing of TCs and CIRs.
Registration

Registration is the first stage in the rating process. This stage establishes a formal connection with ISCA and once complete gives the project or asset access to essential support.

Key activities which make up the Registration stage include:

Corporate Values Registration Form (IS International CVR form)

To notify ISCA of the intent to register a project/asset for an IS rating, the Registrant should submit a completed IS International CVR form to ISCA (available on the ISCA website). This form contains basic information such as the project/asset name, contact names, registering organisation, details for the rating, and the type of rating/score which the Registrant intends to target. It also includes a declaration of any significant project impacts on community or the environment, specifically aiming to cover human rights, labour and anti-corruption.

This CVR form is not a contract and is not binding in any way.

The information included in the CVR form will be used to prepare a rating fee structure for the pilot project. This rating fee structure will be based on whether the project is:

- Single asset
- Major project
- Multi-asset and complex

All rating fees will be in Australian dollars.

The ISCA Case Manager will be the main point of contact from the time the CVR is received. They will contact the Registrant to discuss the IS rating and key next steps.

IS International CVR Form Review

The completed CVR form and any supporting documentation is presented to the ISCA Technical Ratings Committee (TRC) for review and consideration before projects can be accepted as pilots.

This process may take up to 4 weeks to be completed.

The TRC may respond to the request with questions or points for clarification before making a final determination. It is possible that direct interaction between the TRC and the applicant may be required.

The TRC may also seek legal advice from an external council before proceeding with a determination.

IS Rating Agreement

Once ISCA has approved the project as a pilot, a draft IS Rating Agreement (pilots) will be issued to the Registrant. This Rating Agreement is a formal contract which sets out the terms on which the IS rating will take place and the basis on which the Registrant may promote the Rating for the Project/Asset, and use the Trade Marks and any associated logos. Once the agreement has been approved by ISCA and the Registrant, it can be executed and the Rating can formally commence.

The IS Rating Agreement will also include final details on the rating fees for the project. Support time and expenses will be tracked monthly and progress will be reported quarterly.

At the time that Rating Agreement is executed the first invoice for the Registration and Support fee will be issued.

Appointment of Case Manager Proxy

The project team identifies a suitable and appropriately qualified Case Manager Proxy.

This person must:

- Be an IS Accredited Professional (ISAP)
- Maintain their ISAP accreditation throughout the delivery of the rating
- Have qualifications in environmental management, sustainability, engineering, or similar, and have demonstrated experience using rating tools/frameworks.
- Be appointed by the project team.

Project team notifies ISCA when they have identified a suitably qualified person and sends through a CV and letter of recommendation covering the above requirements.
The Case Manager Proxy will act on behalf of the ISCA Case Manager and will provide ongoing support and guidance on the application of the IS rating scheme. They should be local to the project and do not have to be external, or a separately appointed professionals.

Industry Launch Event

An industry event should be organised and held within three months of the registration to celebrate the commitment made by the project team.

Invitees should include as a minimum, key media personnel, members of the supply chain, government stakeholders, project team members and ISCA.

Following the event a media release should be prepared and circulated.

Assessment

Soon after registration, the Assessor, Case Manager and Case Manager Proxy will discuss and confirm the timing and agenda for a kick off workshop. The kick-off workshop will be held with the Case Manager/Proxy and the project/asset management team to brief the team on the process for pursuing an IS rating, establish project/asset parameters, undertake the weightings assessment, to clarify scope, timing and base case, and generally to commence the assessment process on a positive basis.

Projects/assets then undertake self-assessment using the IS rating tool as they proceed through the relevant infrastructure lifecycle phases. Self-assessment essentially involves the project or asset management team assessing their sustainability performance and determining their rating using the rating tool.

The Assessor should lead the assessment process and preparation of the assessment for submission but for best results, many team members need to be involved and manage the aspects relevant to their area of specialisation. A benefit of the self-assessment is that it can provide the team with a checklist of activities and initiatives that can be implemented to improve the overall sustainability performance of the project or asset.

Key activities which make up the Assessment stage include:

**Kick Off Workshop**

The kick off workshop is the first time where ISCA and the project/asset management team can sit down, engage with each other and discuss the rating as a whole. It is important that a good cross section of the team are represented at the workshop to promote internal buy-in and ownership of the IS rating pursuit and infrastructure sustainability more generally. Examples of the participants might include, but are not limited to:

- Project Director
- Construction Manager
- Network Operations
- Quality Manager
- Area Managers
- Commercial Manager
- Design Leads
- Stakeholder Relations Manager
- Environment Manager

Key agenda items for this workshop may include:

- A presentation by ISCA staff of an overview of the IS ratings scheme, trends and traction, and the IS rating process.
- A presentation by the Assessor to describe some of the drivers for pursuing a rating, how the IS rating aligns with other key sustainability targets/contract requirements, how the IS rating is going to be delivered and managed within the project/asset team.
- Discussion of the project scope and boundaries, schedule, and roles and responsibilities.
- Team break-out sessions to identify key risks, opportunities and areas where the rating tool needs adjusting for the local context.
Preliminary Self-Assessment: Stretch and Conservative scores

Before, during or after the kick off workshop the Assessor should undertake a self-assessment to determine two scores:

- **Conservative score**: based on what is simple and effective to achieve
- **Stretch score**: including opportunities that could be implemented with additional time or cost.

The weightings assessment needs to be drafted to complete the preliminary self-assessment. The outcomes of the weightings assessment should determine what is materially important for the project and therefore should inform the stretch targets and the final target score.

Based on this exercise a target score should be defined (may or may not be the same as any other score defined through an agreement with the project owner).

**IS Management Plan**

Following registration and the kick off workshop, the Case Manager will provide the Assessor with a template for an IS Management Plan.

The purpose of the IS Management Plan is to facilitate the management and implementation of IS Design and As Built ratings on a registered project/asset. The objectives of the management plan are to:

- Describe the sustainability objectives and drivers for applying the IS rating scheme on the project/asset.
- Outline the approach to applying the IS rating tool on the project/asset (scope and boundaries, timing, reference design, approach to the credits, weightings assessment etc.)
- For complex projects/programs made up of several packages, describe a suitable program delivery approach.
- Describe and facilitate planning towards key IS timing and milestone requirements.
- Outline ISCA’s role and specific support requirements for the duration of the rating process.
- Assign responsibility and key tasks associated with achieving the IS rating.
- Outline a management approach for capturing the business case for Infrastructure Sustainability.

The IS Management Plan should also include key communication activities and marketing opportunities which the project/asset can implement throughout the rating process, including but not limited to:

- The promotion of the commitment to pursue an IS rating.
- Communication of achievements and good news stories throughout the assessment stage.
- Facilitating internal buy-in and team support of the IS Rating.
- Promotion of the achievement of a certified rating including the Certification Award event.

ISCA encourages Assessors to consider each section within the plan and how they might be appropriately used on the project/asset, either as part of this IS Management Plan or as part of another management system (e.g. project sustainability plan/strategy).

**Verifier Appointment**

Shortly after the completion of the kick off workshop, ISCA will nominate Verifiers (from the verifier panel) to the Assessor for endorsement. It is important that verifiers have no conflict of interest with the project/asset. Once endorsed the verifier(s) will be appointed for the life of the rating.

Verifiers are used for two key activities from the Assessment and Verification stages. During the Assessment stage, a verifier(s) will review and verify the weightings assessment and the Base Case Proposal. During the verification stage the verifier(s) will complete the review and verification of the self-assessment submission.

**Weightings Assessment**

Weightings assessment identifies the most important (material) sustainability issues for infrastructure projects and assets, and in particular results in adjustments to weightings within the IS rating tool to tailor and focus the
tool to the specific project/asset stakeholders and context. For example, if an asset uses significant energy in operation (e.g. a railway) and also in construction (e.g. due to lots of earth moving and tunnelling) then ‘Energy and Carbon’ is likely to be an issue of high Materiality and therefore it is sensible to increase the weighting of the Energy and Carbon credits compared to less material issues.

The weightings assessment may be conducted in the following ways:

(a) By a stakeholder workshop
(b) By a project/asset team (representing stakeholders)
(c) By an individual Assessor

Option (a) is recommended and could be informed by a materiality assessment, Environmental Impact Assessment, risk assessment or similar. Option (b) or (c) is allowable but only if informed by a materiality assessment, Environmental Impact Assessment, risk assessment or similar.

The weightings assessment process involves three main steps:

1. Preparation
2. Assessment
3. Verification

**Preparation**

Complete the Project or Asset Input worksheet in the IS Scorecard and gather the following information (if available):

a) Existing materiality assessment, Environmental Impact Statement or similar
b) Functional spec.
c) Construction methodology
d) Asset design life
e) Location map showing:
   - construction footprint
   - proximity to natural hazards
   - water sources
   - receiving waters
   - noise receivers
   - vibration receivers
   - population density
   - light receivers
   - potential for flood impacts up and downstream
   - ecological habitat within and surrounding the project/asset including sensitivity
   - heritage values
f) Contamination studies
g) Flood maps
h) Stakeholder analysis

Determine how the weightings assessment will be undertaken. If it is being undertaken by a team (with or representing stakeholders), schedule a meeting and prepare the team for the meeting by sending them appropriate background information. It may be useful for each participant to complete the weightings assessment on their own and bring this to the meeting.

**Assessment**

Complete the Weightings sheet in the IS Scorecard with the assessment team (or as an individual). Note that some topics are assessed at the category level and some at the credit level.

Make sure you select ‘developed’ or ‘developing’. This will impact the default weightings.

Where there is no existing materiality assessment, EIA, risk assessment or similar, answer each of the Questions to help to determine the materiality score for that topic. The Sustainable Development Goals Index can be used as evidence, where relevant, for the materiality score claimed. Consider the significance of each issue to the overall project, typically on a worst case basis, even if the issue is only relevant to a portion of the project (e.g. if only a small portion of the project is in an ‘urban’ environment then still select urban as the answer as this is likely to reflect the worst case impact). Ensure that answers reflect the consensus of the team.

Where there is a suitable existing materiality assessment, EIA, risk assessment or similar, start by considering those issues covered in the assessment. For these issues, insert Alternate Materiality Scores as follows:
• Key assessment issues = 3 (may be scored 4 if for some reason an issue is especially dominant, please justify)
• Other assessment issues = 2
• Not raised within the assessment but within its scope = 0

For those issues not covered within the assessment and outside its scope then answer the weightings assessment Questions instead (see Instructions sheet for more details).

Keep relevant documentation to justify the assessment and note this evidence to the Evidence Supplied column. Number the evidence using the Evidence Naming Convention (refer to the IS Technical Manual for details) and refer to relevant sections of the assessment to assist the Verifier(s).

Once completed, the tool calculates a Materiality Score from 0 to 4 as follows:

0  Not material (scoped out)
1  Low materiality (half as important as moderate)
2  Moderate materiality
3  High materiality (50% more important than moderate)
4  Very high materiality (twice as important as moderate)

Based on the Materiality Scores, the tool adjusts the credit weightings from their defaults, it removes any credits that fall below a threshold and normalizes the points so that they total 100 (excluding Innovation credits).

Review the Final Credit Points. The Charts provided may assist the review. If the team disagrees with any of the credit weightings then an Alternate Materiality Score may be proposed with suitable Justification. Review the Final Credit Scores again after providing any alternates.

Provide the completed weightings assessment and relevant evidence to the ISCA Case Manager for verification.

Verification

The purpose of verification is to check that the weightings assessment has been conducted appropriately and that the resulting weightings are fair and appropriate to be used within the IS rating tool scorecard for this rating. The ISCA Case Manager will review and issue the weightings assessment to a Verifier(s) for verification with the Base Case Proposal.

The Verifier(s) may verify the assessment or ask for further information. The Case Manager will notify the Assessor whether the assessment has been verified or whether further information is requested. The Assessor will update and resubmit the assessment if required and verifier(s) review will be repeated. If the assessment is not verified after round two then the Case Manager and Assessor will discuss appropriate actions.

Once the weightings assessment has been verified, the Materiality Scores and final credit weightings will be copied by the Case Manager into the IS rating tool scorecard and this will be issued to the Assessor to use throughout the Assessment process.

Base Case Proposal

For Developing Countries, the base case process is only relevant for Materials.

For Developed Countries, the base case process is relevant for Energy & Carbon, Water and Materials.

In the Energy & Carbon, Water and Materials categories, several of the credits adopt an approach of modelling and measuring the performance of the project or asset (in terms of resource consumption or greenhouse gas emissions) and comparing it to a business as usual (BAU) Footprint. See the Base Case Approach section later in this Technical Manual for details.

The Base Case Proposal should be proposed using the form and procedure available through the rating site.

The Case Manager will review the Base Case Proposal and issue the proposal and the weightings assessment to a Verifier(s) for verification.
Technical Clarifications (TC) and Credit Interpretation Requests (CIR)

A TC or CIR can be submitted to ISCA where the Assessor would like a technical aspect of the rating tool clarified or interpreted.

A list of TCs and CIRs will be produced at the kick off workshop and will assist to adjust the pilot tool for the local context.

Technical Clarifications

During the assessment stage, where the Assessor is uncertain as to how a credit is interpreted, the Assessor should submit to the Case Manager a Technical Clarification with sufficient supporting evidence for ISCA to make a ruling.

Credit Interpretation Request

During the assessment stage, where the Assessor wishes to propose an alternative, yet equivalent method for meeting a credit, the Assessor should submit a Credit Interpretation Request (CIR) with sufficient supporting evidence for ISCA to make a ruling.

TCs and CIRs do not need to be submitted as one package to ISCA. They should be submitted as the issues arise throughout the assessment stage to enable the issues to be resolved and feedback to be provided in a timely manner.

TCs and CIRs should be submitted to ISCA using the appropriate forms and procedures available through the rating site. These submissions will be reviewed by ISCA and provided to the ISCA Technical Steering Committee for review. The Technical Steering Committee will review TCs/CIRs and make rulings on each. Rulings will be published on the ISCA website and can be downloaded for use by all registered IS projects/assets.

ISCA staff may also raise ‘non-rating’ TCs and CIRs at their discretion.

Where necessary ISCA may seek advice from Technical Specialists regarding TC/CIRs to assist the TSC to make a ruling.

Case Manager Support

ISCA provides technical support at key points during assessment stage. This support includes:

1. Facilitating the kick-off workshop
2. Undertaking quarterly audits (as required) with the project team, Assessor and Case Manager Proxy to review progress
3. Processing and finalising TCs and CIRs

The Case Manager Proxy will provide ongoing support throughout the assessment stage. This support includes:

4. Answering technical queries (including advise and review on Technical Clarifications and Credit Interpretation Requests)
5. Monthly meetings with the Assessor and other key stakeholders as required (either face to face or by telephone) to review progress
6. Ongoing phone and email support
7. Managing the IS rating process with the Assessor
Verification

Assessment Submission

Once the project/asset has reached the end of the assessment stage (for a Design rating this would be at the end of design, for an As Built rating this would be close to the end of construction), the finalised self-assessment including a completed scorecard (including all credit tabs, and all evidence, needs to be submitted to ISCA for verification.

To submit the self-assessment for verification the Assessor should upload all required information onto their rating site (this can be uploaded throughout the assessment process if desired) and notify their Case Manager when this is ready.

Evidence Documents

Evidence documents must be supplied to ISCA electronically and stored on the secure Rating Site.

Evidence documents should be stored in the evidence folder under sub-folders as set out. Files should be named using the evidence naming convention as follows:

‘Yyy-xi. Filename’, where:

Yyy = the category abbreviation,

x = the credit number within that category and

i = the sequential document letter (i.e. a, b, c etc.).

Also indicate precisely the section(s) and page number(s) within the document where the evidence can be found. This will assist the verifiers to undertake their review.

For example, a performance report which is the 2nd evidence document for the 3rd credit within the ‘Man’ category would be listed as:

‘Man-3 b. Performance Report [Section 3.1, p45]’.

Where one document is used as evidence for more than one credit, it need not be saved in another category sub-folder again. The reference in the evidence column in the tool scorecard can simply refer back to the file previously identified.

Documents will be kept confidential and will only be accessible by ISCA and the verifiers.

Verification

4 weeks before the first round of verification, the Case Manager will issue the Assessor with an invoice for the Verification and Certification fee.

Before the self-assessment is submitted to the verifiers for verification, the Case Manager will review the submission to check that it conforms to submission requirements (as per above evidence discussion). Once all requirements have been addressed, ISCA will request the verifier(s) to undertake the verification.

The verification of the project/asset self-assessment will be completed in two rounds.

Round 1

Verifiers review the submitted self-assessment including all evidence, and agree to a level and score verified, plus a set of recommendations which advise the Assessor of what is needed to meet their original self-assessed score. That is, if the Assessor self-assesses at level 2 but the Verifiers verify at level 1, they will outline what else would be required to meet level 2.

The outcomes of the round 1 verification will be provided to the Assessor by the Case Manager.

The Assessor needs to confirm whether they will accept the round 1 score achieved or will revise and re-submit their self-assessment for a second round of verification.

Mid-Rounds Verifier Meeting

If required, the Case Manager Proxy can organise a meeting between the Verifiers and the Assessor to clarify parts of the round 1 feedback.

This meeting cannot be used to present new evidence and must be no longer than 2 hours in duration.

The meeting can be held face to face or via video link.

Round 2

If desired, the Assessor will re-submit their self-assessment to include:
• Any amended self-assessment levels. This cannot include revised levels higher than the original self-assessed levels, that is, if the round 1 self-assessed Level was Level 2, the round 2 self-assessed Level cannot be Level 3, if changed it can only be to level 1 or nil. At this point the Assessor may decide to accept the verified score for some credits, thereby reducing the Level, and provide additional evidence for others.

• Any additional evidence to address the Verifier(s) comments.

• Any revised credit summary forms to address the Verifier(s) comments. Any changes to the originally submitted credit summary forms need to be made using red text.

The revised self-assessment will be provided to the Verifier(s) for verification. The outcomes of the round 2 verification will be provided to the Assessor by the Case Manager.

Following the round 2 verification, and before the rating moves into certification, the Assessor will be asked to confirm whether they intend to dispute the verification outcomes. If they do, a dispute process will be initiated to resolve the issue. They will also be asked to the best of the management team’s knowledge if the project/asset has any actual, pending or possible fines, penalties or prosecutions. Once confirmed that there are no fines, penalties or prosecutions, the rating will move to Certification. If this is confirmed otherwise, then ISCA, at its discretion, will consider whether to proceed to Certification or not.

Certification

The Verifiers will provide a recommendation to the Technical Steering Committee as to the score and rating level the rating has achieved.

Subject to meeting necessary requirements, ISCA will certify the achievement of a rating at either ‘Commended’, ‘Excellent’ or ‘Leading’ performance level.

Key activities of the Certification stage include:

Certificate Award

The achievement of a Certified Rating is celebrated by awarding the Rating Certificate to a representative of the Registrant organization(s). This is best done at an event and ISCA will work with the project/asset team to develop a suitable approach.

Key messages

ISCA and the Registrant will agree on a suite of key sustainability messages that can be used by both organisations to promote the project/assets achievement of a certified IS rating. These messages will be presented on the ISCA website within the IS Ratings Directory and will highlight the areas of the tool where the project/asset has performed particularly well (rating highlights).

Case Studies

Elaborating on the key messages, the Case Manager and Assessor should work together to develop/confirm a set of case studies which can be used to promote the achievement of the Certified IS rating. These case studies may already have been developed throughout the Assessment stage and may include:

- Case studies which highlight the business case for infrastructure sustainability.
- Initiatives that have been implemented on the project.
- Category/Credit specific case studies which can be used as examples in the IS Technical Manual and/or various ISCA training/presentation materials.
- Case studies which can be uploaded into the ISCA knowledge hub and be made available to all ISCA members.

Feedback

ISCA will seek formal feedback from the Assessor following certification. The objectives of the feedback process include:

- To query whether the Registrant’s objectives for applying the rating scheme were achieved.
- To understand how well ISCA provided support throughout the rating process.
• To gather feedback on the rating tool and rating process and their effectiveness.
• To understand and reflect on any issues or constraints experienced by the team throughout their pursuit of the ISCA rating.
• To discuss the business case for sustainability and the cost/benefit impact of the IS rating tool.

Design to As Built

The Design rating is an interim rating and is therefore superseded by the As Built rating once completed.

Once a Design rating is certified the rating will automatically move on to an As Built rating unless otherwise advised. The As Built rating will build on the already certified Design rating which means that evidence from the design phase does not need to be re-assessed.

The transition from a Design rating to an As Built rating will be facilitated by the Case Manager and involves the Case Manager issuing an As Built scorecard (contains the Design rating outcomes and verifier comments), and seeking a meeting to discuss the Design rating comments and any advice for As Built.

The following process should be followed when preparing an As Built submission after a certified Design rating:

• Use the revised As Built scorecard provide by the Case Manager to prepare the self-assessment
• The design submission evidence needs to be updated only where something has changed during the construction phase e.g. if a late change to the design has been made than the Base Case Proposal and relevant credits would need to be updated and re-submitted for verification in the As Built rating submission.
• The evidence should focus on demonstrating how the credits have been met through construction e.g. photos of a design initiative being implemented, monitoring reports.
• The As Built rating submission is an update to the Design rating:
  - During the Design rating, the verifier may have made specific comments for the As Built rating. These would have been noted in the scorecard and presented as blue text. These comments must be addressed for the As Built rating.
  - Evidence labelling should continue from the Design rating, that is, if 5 pieces of evidence were provided in the Design rating than the first piece of evidence for As Built would be labelled ‘6 (f)’.
  - Do not generate new Credit Summary forms for As Built. Update the Design submissions with the further relevant information and highlight the changes using red text.
### Glossary

Note that some credit specific terms are defined in the credit description sections rather than this glossary.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adaptation</strong></td>
<td>Actions in response to actual or projected climate change and impacts that lead to a reduction in risks or realisation of benefits.</td>
</tr>
<tr>
<td><strong>Adaptive capacity</strong></td>
<td>The capacity of an infrastructure system or organisation to adapt to climate change. This can be determined by factors such as knowledge, location and emergency management.</td>
</tr>
<tr>
<td><strong>Biodiversity</strong></td>
<td>The variability among living organisms from all sources (including terrestrial, aquatic, marine and other ecosystems and the ecological complexities of which they are part), at all levels of organisation, including genetic diversity, species diversity and ecosystem diversity.</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>A community can be defined across the following divisions: communities of place (within a one – five kilometre radius of the infrastructure asset); communities of interest (e.g. specific groups such as elected representatives, traditional owners, affected landowners) and communities with specific issues (e.g. cycling groups or local businesses etc.).</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td>The degree to which any road or pathway network joins both internally within the subject site, and externally to the surrounding area, particularly to existing local streets, pathways, community facilities and other potential desire lines.</td>
</tr>
<tr>
<td><strong>CRED</strong></td>
<td>Centre for Research on the Epidemiology of Disasters</td>
</tr>
<tr>
<td><strong>Design principles</strong></td>
<td>These are the design rules and processes required to achieve the project objectives, inform the design development and be consistently referred to throughout each phase of the infrastructure life-cycle.</td>
</tr>
<tr>
<td><strong>Developed Country</strong></td>
<td>All countries, other than developing countries as defined below.</td>
</tr>
<tr>
<td><strong>Developing country</strong></td>
<td>A developing country, also called a less developed country or an underdeveloped country, is a nation or a sovereign state with a less developed industrial base and a low Human Development Index (HDI) relative to other countries. Eligible developing countries are acknowledged by the World Bank <a href="http://pubdocs.worldbank.org/en/661581485792626997/list-of-Eligible-Developing-Countries.pdf">http://pubdocs.worldbank.org/en/661581485792626997/list-of-Eligible-Developing-Countries.pdf</a></td>
</tr>
<tr>
<td><strong>Ecolabel</strong></td>
<td>An “eco-label” identifies a product that meets specified environmental performance criteria or standards, and is awarded by a third-party organisation to products or services that are determined to meet the criteria or standards.</td>
</tr>
<tr>
<td><strong>Ecopoints (Au)</strong></td>
<td>Ecopoints are a composite measure of the overall environmental impact of any material, product or service.</td>
</tr>
<tr>
<td><strong>EM-DAT:</strong></td>
<td>Emergency Events Database, the International Disaster Database</td>
</tr>
<tr>
<td><strong>Ecosystem Functioning</strong></td>
<td>The complex interactions between the biotic and a-biotic parts of an ecosystem that create and maintain interconnections between species,</td>
</tr>
</tbody>
</table>
populations and communities as well as between living organisms and the non-living features of the ecosystem.

**Ecosystems**

The dynamic combinations of plant, animal and micro-organism communities and their non-living environment (e.g. soil, water and the climatic regime) interacting as a functional unit.

**Effective water use**

Refers to the impact associated with the production and delivery of water of a particular quality, that is, how much effort did it take to produce this water and get it to the point of use, whether it is sourced from a utility’s recycled water main, or an on-site stormwater or sewage treatment plant. It takes into account the starting quality of the water (such as a water utility’s dam, an on-site stormwater detention pond during construction, or sewage in a nearby main), the particular treatment processes required to improve the quality to the level required for the application, and the transportation of the water from source to point of use (such as a purpose-built pipeline, a utility distribution system, or tanker). Effective water use encourages whatever scale of recycling that makes ecological and economic sense. It provides a measure of a project’s success in meeting its water demand with locally appropriate alternative water sources, so a good proxy for this impact is the embedded energy of the water when it reaches the point of use.

**Efficient water use**

Refers to the volume of water used to deliver a service. It provides a measure of a project’s success in avoiding and reducing water use whilst still achieving an appropriate quality of outcome e.g., material conditioning in preparation for paving. It should be expressed as volume of water per unit of service, e.g., L/m² material conditioned or L/person/day for operational staff.

**Embedded or Embodied Energy**

Energy that is used during the entire lifecycle of the commodity for manufacturing, transporting and disposing of the commodity as well as the inherent energy captured within the product itself.

**End use**

The physical technology or practice consuming a resource such as water (e.g. toilet, or wash-down of machinery);

**End use analysis**

A method for comparing design options to show how much water can be saved and how much non-potable demand remains, which can be met with an alternative source. The basic principle of end use analysis is always the same: the key elements of an end use are the combination of the technology and the behaviour that together deliver a service – the technology determines the design volumes and/or rates, and the behaviour determines the volumes in use.

**Exposure**

The exposure of an infrastructure system or organisation reflects its location (region, elevation, aspect, proximity to sources of hazard such (coast, rivers, floodplain, forest, steep land etc.) and the direction and magnitude of change of the project’s critical climatic variable(s). It can be defined as the influences or stimuli that impact on a system - broadly it is the changes to climatic conditions that system will be exposed to.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forecast useful life</td>
<td>The forecast useful life of the infrastructure asset is defined to be the original or reforecast design life i.e. the length of time for which it has been designed and built or projected to function until.</td>
</tr>
<tr>
<td>Functionality</td>
<td>Relates to the degree of connectivity (joining together) between vehicular, cyclist and pedestrian connections of the surrounding existing, and where possible future, land uses and community.</td>
</tr>
<tr>
<td>Greenhouse Gases (GHGs)</td>
<td>Trace gases such as carbon dioxide, water vapour, methane and CFCs that are relatively transparent to the higher-energy sunlight, but trap the lower-energy infrared radiation in the atmosphere.</td>
</tr>
<tr>
<td>Health</td>
<td>Health is defined as fitness, a strong constitution and a state of wellbeing. Health encompasses both physical and mental health. Community health deals with the betterment of health characteristics from a whole of community perspective.</td>
</tr>
<tr>
<td>high risk procurement categories</td>
<td>Procurement categories where there are more likely to be environmental or social supply chain risks and opportunities.</td>
</tr>
</tbody>
</table>
Landscape Management Plan
This requires a specifically written plan for landscape management that outlines the long-term strategies and identifies short-term actions to achieve sustainable maintenance goals. The plan should cover as a minimum plant and general maintenance, water use, erosion, replacement of plants, weed management, lighting and materials maintenance.

Learning
Is a process that brings together cognitive, emotional and environmental influences and experiences for acquiring, enhancing or making changes in one’s knowledge, skills, values and world views.

Life cycle assessment (LCA)
An objective process to evaluate the environmental burdens associated with a product, process or activity by identifying and quantifying energy and materials used and wastes released to the environment, to assess the impact of those energy and materials uses and releases on the environment, and to evaluate and implement opportunities to affect environmental improvements. The assessment includes the entire life cycle of the product, process or activity, encompassing extraction and processing of raw materials, manufacturing, transportation and distribution, use/reuse/maintenance, recycling and final disposal.

Life Cycle Environmental Impact Assessment
The longer form and more correct term for “Life Cycle Assessment (LCA)” because it distinguishes LCA from Life Cycle Costing by emphasising environmental impact and recognises that the outcome is expressed as a measure of environmental impact.

Life Cycle Impact Assessment (LCIA)
The Life Cycle Impact Assessment (LCIA) phase of an LCA is the evaluation of potential human health and environmental impacts of the environmental resources and releases identified during the LCI. Impact assessment should address ecological and human health effects; it should also address resource depletion.

Life Cycle Inventory (LCI)
An objective, data-based process of quantifying energy and raw material requirements, air emissions, waterborne effluents, solid waste, and other environmental releases incurred throughout the life cycle of a product, process or activity.

Life Cycle Management (LCM)
Life Cycle Management is a framework for business planning and management that helps business to: Analyse and understand the life cycle stages of the business, product or service; Identify the potential economic, social, or environmental risks and opportunities at each stage; and establish proactive systems to pursue the opportunities and manage or minimise the risks.

Minority Group
National or ethnic, religious and linguistic minorities, pursuant to the United Nations Minorities Declaration. In this manual reference to minority groups includes indigenous population.

Non-potable water
Lower quality water suitable for other purposes such as toilet flushing or dust suppression.

Opportunities
Benefits which might be delivered by, or for, the project or asset. In the context of this rating scheme, these are specifically sustainability related opportunities.
Potable water  High quality water suitable for drinking and cooking. This is the standard supplied by water utilities, so it sometimes called town water or reticulated water.

Resilience  The capacity of an infrastructure system or organisation to cope with, and quickly recover from, an adverse climate change impact. Resilience can be enhanced through changes in management, procedure and awareness, as well as physical measures.

Risk (climate change)  The chance of something happening (as a result of climate change) that have an impact (positive or negative) on achievement of an infrastructure system or organisation’s objectives.

Safety  Safety means the avoidance of harm or injury and where a person is secure and protected. In the community context safety means that people in the community living near the asset or users of the asset are able to go about their daily activity without fear of their own safety or the safety of others.

Scope 1 GHG Emissions  Direct GHG emissions from sources that are owned or controlled by the infrastructure constructor and/or operator. For example, emissions from combustion in owned or controlled boilers, furnaces and vehicles.

Scope 2 GHG Emissions  GHG emissions related to the generation of purchased electricity by the infrastructure constructor and/or operator.

Scope 3 GHG Emissions  All other indirect emissions that are a consequence of the activities of infrastructure delivery and/or operation, but occur from sources not owned or controlled by the infrastructure constructor and/or operator. Some examples include third party deliveries, business travel activities and use of sold products and services.

SDG  United Nations Sustainable Development Goals

Service provision  The underlying service provided by the water end use (e.g. sanitation in the case of a toilet, or clean machinery in the case of wash-down);

Smart Infrastructure  Smart infrastructure encompasses networked infrastructure that uses sensors and communications technologies to better use or sustain resources. Examples include smarter electricity grids to improve grid reliability and make more efficient use of energy; transport systems to optimise traffic flows; and water networks to improve water productivity in agriculture.

Smart metering  Using metering devices that allow real time utility consumption monitoring. Smart meters can identify abnormalities and generate alarms so that actions can be taken to prevent or reduce losses. They also help to understand consumption patterns.

Sub-metering  Monitoring of usage on a portion of a distribution network past a main meter.

UN  United Nations

UNISDR  United Nations International Strategy for Disaster Reduction

UNESCO  United Nations Educational, Scientific and Cultural Organisation
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerability</td>
<td>The level of risk that remains once the potential impacts of climate change have been addressed as much as possible by adaptation.</td>
</tr>
<tr>
<td>Water demand management</td>
<td>An approach to conserving water, which focuses firstly on what the water is used for (the end use) and secondly how that volume of water can be reduced whilst providing the same level of service.</td>
</tr>
<tr>
<td>Water use</td>
<td>All direct use of potable and non-potable water throughout the design, construction and operation phases of the infrastructure asset.</td>
</tr>
<tr>
<td>Weighting</td>
<td>Weighting is the process of converting indicator results of different impact categories by using numerical factors based on value-choices. It may include aggregation of the weighted indicator results.</td>
</tr>
<tr>
<td>Wellbeing</td>
<td>Wellbeing is a state of being and feeling well, happy and prosperous. Community Wellbeing is a concept that encapsulates an optimal quality of healthy community life - one in which people are connected, have equitable access to social networks and infrastructure, meaningful employment, and live in vibrant and sustainable communities with distinct local identities.</td>
</tr>
</tbody>
</table>
## Credit Summary Table

### Figure C: Credit Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Management Systems</strong></td>
<td></td>
</tr>
<tr>
<td>Man-1</td>
<td>Sustainability leadership and commitment</td>
</tr>
<tr>
<td>Man-2</td>
<td>Risk and opportunity management</td>
</tr>
<tr>
<td>Man-3 Developed Countries</td>
<td>Organisational structure, roles and responsibilities</td>
</tr>
<tr>
<td>Man-3 Developing Countries</td>
<td>Organisational structure, roles and responsibilities</td>
</tr>
<tr>
<td>Man-4 Developed Countries</td>
<td>Inspection and auditing</td>
</tr>
<tr>
<td>Man-4 Developing Countries</td>
<td>Management System Accreditation</td>
</tr>
<tr>
<td>Man-5</td>
<td>Reporting and review</td>
</tr>
<tr>
<td>Man-6</td>
<td>Knowledge sharing</td>
</tr>
<tr>
<td>Man-7</td>
<td>Decision-making</td>
</tr>
<tr>
<td>Man-8</td>
<td>Capacity building and workforce</td>
</tr>
<tr>
<td><strong>Procurement and Purchasing</strong></td>
<td></td>
</tr>
<tr>
<td>Pro-1</td>
<td>Project sustainable procurement strategy</td>
</tr>
<tr>
<td>Pro-2</td>
<td>Supplier selection and development</td>
</tr>
<tr>
<td><strong>Climate Change Adaptation</strong></td>
<td></td>
</tr>
<tr>
<td>Haz-1</td>
<td>Natural hazard risk and adaptation</td>
</tr>
<tr>
<td><strong>Energy and Carbon</strong></td>
<td></td>
</tr>
<tr>
<td>Ene-1 Developed Countries</td>
<td>Energy and greenhouse gas monitoring and reduction</td>
</tr>
<tr>
<td>Ene-1 Developing Countries</td>
<td>Energy and greenhouse gas monitoring and reduction</td>
</tr>
<tr>
<td>Ene-2</td>
<td>Use of renewable energy</td>
</tr>
<tr>
<td>Ene-3</td>
<td>Carbon offsetting</td>
</tr>
<tr>
<td><strong>Water</strong></td>
<td></td>
</tr>
<tr>
<td>Wat-1 Developed Countries</td>
<td>Water use monitoring and reduction</td>
</tr>
<tr>
<td>Wat-1 Developing Countries</td>
<td>Water use monitoring and reduction</td>
</tr>
<tr>
<td>Wat-2 Developed Countries</td>
<td>Replace potable water</td>
</tr>
<tr>
<td>Wat-2 Developing Countries</td>
<td>Replace potable water</td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td></td>
</tr>
<tr>
<td>Mat-1</td>
<td>Materials footprint measurement and reduction</td>
</tr>
<tr>
<td>Mat-2</td>
<td>Environmentally labelled products and supply chains</td>
</tr>
<tr>
<td><strong>Discharges to Air, Land &amp; Water</strong></td>
<td></td>
</tr>
<tr>
<td>Dis-1</td>
<td>Receiving water quality</td>
</tr>
<tr>
<td>Dis-2</td>
<td>Noise</td>
</tr>
<tr>
<td>Dis-3</td>
<td>Vibration</td>
</tr>
<tr>
<td>Dis-4</td>
<td>Air quality</td>
</tr>
<tr>
<td>Dis-5</td>
<td>Light pollution</td>
</tr>
<tr>
<td><strong>Land</strong></td>
<td></td>
</tr>
<tr>
<td>Category</td>
<td>Credit</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Land Use Value</td>
<td>Lan-1 Land Use Value</td>
</tr>
<tr>
<td>Conservation of onsite resources</td>
<td>Lan-2 Conservation of onsite resources</td>
</tr>
<tr>
<td>Contamination and remediation</td>
<td>Lan-3 Contamination and remediation</td>
</tr>
<tr>
<td>Flooding design</td>
<td>Lan-4 Flooding design</td>
</tr>
<tr>
<td>Waste Management</td>
<td>Was-1 Waste management</td>
</tr>
<tr>
<td>Developed Countries</td>
<td>Was-2 Developed Countries Diversion from landfill</td>
</tr>
<tr>
<td>Developing Countries</td>
<td>Was-2 Developing Countries Diversion from landfill</td>
</tr>
<tr>
<td>Deconstruction/ Disassembly/ Adaptability</td>
<td>Was-3 Deconstruction/ Disassembly/ Adaptability</td>
</tr>
<tr>
<td>Ecological Value</td>
<td>Eco-1 Ecological value</td>
</tr>
<tr>
<td>Habitat connectivity</td>
<td>Eco-2 Habitat connectivity</td>
</tr>
<tr>
<td>Community health and well-being</td>
<td>Hea-1 Community health and well-being</td>
</tr>
<tr>
<td>Crime prevention</td>
<td>Hea-2 Crime prevention</td>
</tr>
<tr>
<td>Heritage assessment and management</td>
<td>Her-1 Heritage assessment and management</td>
</tr>
<tr>
<td>Monitoring of heritage</td>
<td>Her-2 Monitoring of heritage</td>
</tr>
<tr>
<td>Stakeholder engagement strategy</td>
<td>Sta-1 Stakeholder engagement strategy</td>
</tr>
<tr>
<td>Level of engagement</td>
<td>Sta-2 Level of engagement</td>
</tr>
<tr>
<td>Effective communication</td>
<td>Sta-3 Effective communication</td>
</tr>
<tr>
<td>Addressing community concerns</td>
<td>Sta-4 Addressing community concerns</td>
</tr>
<tr>
<td>Urban and landscape design</td>
<td>Urb-1 Urban and landscape design</td>
</tr>
<tr>
<td>Implementation</td>
<td>Urb-2 Implementation</td>
</tr>
<tr>
<td>Innovation</td>
<td>Inn-1 Innovation</td>
</tr>
</tbody>
</table>
Governance involves the establishment and oversight of an organisation’s, project or asset’s purpose, systems, structure and processes, and their implementation for the effective delivery and operation of infrastructure. Good governance in the context of infrastructure sustainability is vital, and is sometimes referred to as the fourth pillar of sustainability under a quadruple bottom line approach.

The Management and Governance categories focus on measurement of the processes used to deliver and operate infrastructure, while the categories in the other themes focus on the measurement of performance or outcomes achieved. Ideally, it would be sufficient just to measure the performance of projects or assets, however it is recognised that it is currently not possible to measure all relevant aspects of performance. Measuring the quality of the management and governance processes to support sustainability therefore provides additional confidence in project or asset ratings. It also provides suitable lead indicators of performance.

The Management and Governance categories aim to influence internal project or asset management including decision making, supply chain management and management of specific risks including climate change.

The Management and Governance theme contains the following categories:

- Management Systems (Man)
- Procurement and Purchasing (Pro)
- Natural Hazards (Haz)
MANAGEMENT SYSTEMS

Management systems aim to ensure consistent and efficient activities within an organisation, project or asset management. They also provide information to support decision-making. A management system typically comprises four key elements: planning, implementing, measuring and correcting (or ‘Plan, Do, Check, Act’). Management systems may address a variety of issues including sustainability. While effective management systems do not guarantee achievement of sustainability outcomes on their own, they are an essential ingredient for their achievement.

This category encourages sustainability to be comprehensively addressed within management systems from the policy level down to detailed processes.

The International Organisation for Standardisation defines management system as the way in which an organisation manages the inter-related parts of its business in order to achieve its objectives. These objectives can relate to a number of different topics, including product or service quality, operational efficiency, environmental performance, health and safety in the workplace and many more.


Management systems for infrastructure are generally robust and consider the environmental aspects of projects and asset operation on a compliance basis. Some systems also consider social aspects but it is not common for environmental, social and economic aspects to be considered in a fully integrated way.

Decision making for infrastructure is typically based on financial considerations with occasional use of qualitative or quantitative sustainability criteria. It is still uncommon for sustainability considerations to be incorporated into decision making in any significant way despite increasing interest and desire to do so.

The following seven credits apply to the Management Systems category:

**Man-1** Sustainability leadership and commitment

**Man-2** Risk and opportunity management

**Man-3** Organisational structure, roles and responsibilities

**Man-4 – Developed countries** Inspection and Auditing

**Man-4 – Developing countries** Management System Accreditation

**Man-5** Reporting and Review

**Man-6** Knowledge sharing

**Man-7** Decision making

Good management systems will support good performance across the other themes and categories.

External stakeholder engagement will inform the management system. However, stakeholder engagement is covered in the Stakeholder Participation category.

The measuring and reporting that is carried out as part of the management system may provide evidence for compliance with other category credits.

This category has close ties with the ‘Stakeholder Participation’ category. However, that category addresses the ways in which consultation and participation should be undertaken (how, why, where and when) whereas this category addresses how the results of the consultation should be incorporated into the management systems and decision-making processes.
Man-1 Sustainability Leadership and Commitment

Aim
To reward a commitment to sustainability.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>There are commitments to mitigating negative environmental, social and economic impacts. AND These commitments are embedded into sustainability objectives and/or targets.</td>
<td>The requirements for Level 1 are achieved AND The sustainability objectives and/or targets are reflected in project contracts.</td>
<td>The requirements for Level 2 are achieved. AND The sustainability commitments go beyond mitigating negative impacts to restorative actions (i.e. net positive benefits for society and the environment). AND The sustainability commitments are publicly stated.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Sustainability policy or equivalent. Management plans showing objectives and/or targets.</td>
<td>The evidence for Level 1. Project contracts.</td>
<td>The evidence for Level 2. Evidence that the project includes restorative measures. Evidence that the policy (or equivalent) has been made public.</td>
</tr>
</tbody>
</table>

Additional Guidance

Senior management commitment is essential to achieving sustainability outcomes. This commitment can be demonstrated by the presence of a sustainability policy or equivalent.

Level 1
The sustainability policy must cover environmental, social and economic aspects. The policy may be ‘owned’ by the proponent or the organisation managing the work (e.g. designer in the design phase) but most importantly must apply to the project or asset being rated. The equivalent demonstration could comprise a set of policies that cover environmental, social and economic aspects. Similarly, the document may be a strategy or other high-level document rather than a policy.

Policies must have been in place for the entire duration of the relevant Rating phases and must be endorsed by senior management. For example, for the As-Built Rating, there must have been a sustainability policy in place for the design phase and the construction phase (a number of policies are acceptable as long as there is continuous coverage). Evidence of implementation of the policy is not required as this is covered in other credits.

Sustainability objectives and/or targets must cover environmental, social and economic aspects. Every policy commitment must have at least one objective and/or target linked to it. Objectives and/or targets may relate to other categories within this tool.
IFC’s Performance Standard provides a very good guide on Environmental and Social Standards. See ISCA guidance repository.

**Level 2**

The sustainability objectives and/or targets must be reflected in the major project contracts (e.g. for designer, constructor, operator etc.). Sub-contracts are covered in the Procurement and Purchasing category. Having a contractual requirement to achieve an IS rating is a suitable means and evidence for this. If the contractual requirement for an IS rating is used as evidence for Level 2, then the link between the (policy) commitments and specific IS rating credits that are being targeted, should be explained (as part of meeting the Level 1 criteria).

**Level 3**

There must be at least one commitment to restorative actions. Restorative actions reverse a general trend of deterioration by improving or enhancing environmental or social values. This could also be thought of as “leaving a legacy”. Examples of restorative actions include – addressing human right issues, energy and water security issues, climate change, involuntarily displacement of communities, restoring a degraded ecological habitat, enhancing the value of a heritage item through adaptive reuse, improving the environmental value of a water course, being ‘carbon positive’, reducing noise levels compared to previous operation, enhancing the amenity value of a precinct, providing employment for long term unemployed and reducing the likelihood of floods.

‘Publicly stated’ means that the sustainability policy is freely available to the general public (typically through the internet and/or copies in local facilities such as libraries). It should not have to be requested. Making the policy available to a client and/or other stakeholders is not sufficient.

Check online ISCA Guidance Repository for latest approved references.
Man-2 Risk and Opportunity Management

Aim
To reward the assessment of sustainability risks and opportunities to inform the management approach.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Environmental, social and economic risks are assessed. AND</td>
<td>The requirements for Level 1 are achieved. AND</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>The risk assessment is updated at least annually.</td>
<td>Environmental, social and economic opportunities are also assessed. AND</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Major financial institutions associated with the project can demonstrate compliance the Equator Principles.</td>
<td></td>
</tr>
<tr>
<td>Evidence</td>
<td>Risk register. Minutes of risk assessment meetings. Records of risk reviews.</td>
<td>The evidence for Level 1. AND Project specific report demonstrating how the EP have been met</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Additional Guidance

Risk registers are suitable evidence for this credit and must include environmental, social and economic risks (at least one of each) and must cover the whole project scope. The risk register should include estimates of risk level (typically based on likelihood and consequence), and controls to treat or manage the risk, or acceptance of the risk with justification.

Level 1
Risk assessments should be reviewed at least annually and should also be reviewed at key project phases (e.g. at least in design, construction and operation phases).

IFC’s Performance Standards can be used as a guide for applicant companies to manage their Environmental and Social risks. See ISCA guidance repository.

Level 2
The risk register must include environmental, social and economic opportunities (at least one of each). The standard definition of risk (in ISO 31000) is the “effect of uncertainty on objectives” which is neutral in terms of negative and positive consequences of the uncertainties. The term ‘opportunities’ has been used here to clearly identify risks with positive consequences. A ‘sustainability initiatives register’ or similar record would meet the requirement for opportunity assessment.

Examples of economic opportunities include providing local employment, supporting local businesses, and increasing the city or regional productivity. Economic opportunities usually have a wider benefit than just the financial performance of the project or asset. Equator Principles
The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

EP Financial Institutions commit to implementing the EP in their internal environmental and social policies, procedures and standards for financing projects and will not provide Project Finance or Project-Related Corporate Loans to projects where the client will not, or is unable to, comply with the EP.

The EP’s are based on IFC’s Performance Standards on Environmental and Social Sustainability, which have become globally recognised good practice in dealing with environmental and social risk management (Source IFC).

To achieve Level 2, major Financial Institutions associated with the project should demonstrate compliance the Equator Principles. If the financial institution has already officially adopted the EP’s, then a copy of their EPFI Reporting can be issued as evidence of compliance.

Check online ISCA Guidance Repository for latest approved references.
DEVELOPED COUNTRIES

Man-3 - Organisational Structure, and Roles and Responsibilities

Aim
To reward the allocation of responsibility for sustainability appropriately.

Criteria

<table>
<thead>
<tr>
<th>Benchmark - Developed Country</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A member(s) of the senior management team has central responsibility for managing sustainability AND A principal participant in the team is an IS Accredited Professional whose role is to provide sustainability advice.</td>
<td>The requirements for Level 1 are achieved AND An independent sustainability professional is engaged to monitor and review sustainability performance.</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Organisational chart(s). Position description(s). Accreditation record(s). Evidence of ongoing involvement.</td>
<td>Evidence as for Level 1.</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

Additional Guidance

This credit rewards organisations or projects that have acquired the necessary skills and expertise to assist in achieving sustainability outcomes and have the positioned individuals with those skills and expertise where they can influence decision-making and affect change.

Level 1

‘Senior management’ refers to the top level of management within the project or asset management organisation. The management team is that group that makes day to day management decisions as opposed to an oversight group such as a board or steering committee. The management team would typically consist of the Project/Asset Management Director/Manager and their direct reports. ‘Central responsibility for managing sustainability’ means that a person or persons has specific accountabilities in relation to decision making and management of sustainability including environmental and social aspects. These aspects should be specified in a position description(s). By way of example, social issues could include community complaints, stakeholder participation and community sponsorships.

The IS Accredited Professional must participate throughout the relevant rating phases. The level of participation may be part time but evidence of ongoing involvement must be provided. For example, this might include participation in project design meetings (design phase), project management meetings (construction phase) and operations management meetings (operations phase).

For details of the IS Accredited Professional program see www.isca.org.au.

Level 2

The role of the independent professional is to:

- Review project/asset sustainability performance addressing environmental,
social and economic aspects (e.g. including, but not necessarily limited to, those aspects defined in the IS rating tool)

- Consult with the team and key stakeholders
- Act independently and objectively, challenge conventional thinking and provide a ‘fresh set of eyes’
- Make findings and provide useful recommendations in a manner that demonstrates objectivity, transparency and absence of bias

The independent sustainability professional needs to have qualifications in an environmental, social or economic field. They also need to have at least 10 years’ experience practicing in one or more of these aspects including at least five years’ experience providing sustainability advice. They must be independent and have no vested interest in the project. The role could be fulfilled by a combination of people where it can be demonstrated that their combined skills and experience address the credit requirements.

Monitoring and review needs to be undertaken at least quarterly for the design phase and at least six monthly for the construction phase. Where project durations are shorter than these frequencies, monitoring and review should be undertaken at least once during the relevant period. The act of undertaking an IS rating itself does not warrant achievement of Level 2 for this credit, however, the review role might include providing advice on the IS rating progress and submission.

Independence

To demonstrate independence, the following criteria must be satisfied:

1. The person(s) must not work directly on the project or asset.
2. The person(s) must be engaged to act independently of the project or asset. This could be demonstrated through a scope of works, signed contract, charter, Memorandum of Understanding (MOU), services agreement, commitment statement etc.

The person(s) may be from a client, parent company or third party.

The independent sustainability professional may also be involved in other independent review activities including some that are specific to the achievement of other IS credits.

This independent sustainability professional must not be involved in any activities in relation to the project/asset which would undermine their independence such as:

- Working directly for, or on behalf of, the project
- Preparation of project documentation, including, promotional materials, reports (outside of review reports as part of their role under Man-3), business case / cost benefit materials, support tools, monitoring and modelling data, and Preparation of documentation specific to the project’s achievement of an IS rating, including Technical Clarifications / Credit Interpretation Requests.

Check online ISCA Guidance Repository for latest approved references.
# DEVELOPING COUNTRIES

## Man-3 - Organisational Structure, and Roles and Responsibilities

### Aim

To reward the allocation of responsibility for sustainability appropriately.

### Criteria

<table>
<thead>
<tr>
<th>Benchmark - Developing Country</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A member(s) of the senior management team has central responsibility for managing sustainability AND A principal participant in the team is an IS Accredited Professional whose role is to provide sustainability advice.</td>
<td>The requirements for Level 1 are achieved AND The team includes at least two more IS Accredited Professional.</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Organisational chart(s). Position description(s). Accreditation record(s). Evidence of ongoing involvement.</td>
<td>Evidence as for Level 1.</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Guidance

Developing Countries have the option to use this credit or Credit Man-3 for Developed Countries.

This credit rewards organisations or projects that have acquired the necessary skills and expertise to assist in achieving sustainability outcomes and have the positioned individuals with those skills and expertise where they can influence decision-making and affect change.

**Level 1**

‘Senior management’ refers to the top level of management within the project or asset management organisation. The management team is that group that makes day to day management decisions as opposed to an oversight group such as a board or steering committee. The management team would typically consist of the Project/Asset Management Director/Manager and their direct reports. ‘Central responsibility for managing sustainability’ means that a person or persons has specific accountabilities in relation to
decision making and management of sustainability including environmental and social aspects. These aspects should be specified in a position description(s). By way of example, social issues could include community complaints, stakeholder participation and community sponsorships.

The IS Accredited Professional must participate throughout the relevant rating phases. The level of participation may be part time but evidence of ongoing involvement must be provided. For example, this might include participation in project design meetings (design phase), project management meetings (construction phase) and operations management meetings (operations phase).

For details of the IS Accredited Professional program see [www.isca.org.au](http://www.isca.org.au).

**Level 2**

The two additional ISAP for Level 2 must be principal members of the team and have day to
day involvement in the project throughout the rating phases as relevant to their design, construction or operational discipline.

Check online ISCA Guidance Repository for latest approved references.
DEVELOPED COUNTRIES

Man-4 - Inspection and Auditing

Aim

To reward regular inspection of on-site performance and auditing of the management system.

Criteria

<table>
<thead>
<tr>
<th>Benchmark – Developed Countries</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal environmental inspections of site management are undertaken at least weekly during construction. AND Environmental audits of the management system are conducted. At least one external review or audit is conducted during design. AND During construction at least four audits are conducted per year where at least one is external.</td>
<td>Internal sustainability inspections of site management are undertaken at least weekly during construction. AND Sustainability audits of the management system are conducted. At least one external review or audit is conducted during design. AND During construction at least four audits are conducted per year where at least one is external.</td>
<td>Not applicable</td>
<td></td>
</tr>
<tr>
<td>Evidence</td>
<td>Summary of scheduled and completed inspections and audits. Sample of internal inspection reports. Audit reports. Auditor qualifications.</td>
<td>Evidence as for Level 1..</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Additional Guidance

Inspections

The criteria for inspections do not apply to the design phase.

Internal inspections must be undertaken by a manager or a sustainability or environmental professional. At least 90% of scheduled inspections must be completed during construction. Where works have ceased, inspections are not required but this must be clearly documented in the inspection schedule.

Sustainability inspections must use a checklist which covers environmental and social aspects and the inspection must be documented in a report. In practice, coverage of environmental and community issues meets this requirement.

Audits

For the design phase, at least one external review or audit is required to meet the credit criteria.

Internal audits must be conducted by a suitably qualified auditor who is part of the project or asset management team. Suitably qualified means satisfying the competency requirements of ISO19011:2011 – Guidelines for auditing...
management systems, or equivalent. Evidence of competency could include completion of a recognised training course and/or holding an Exemplar Global Auditor Qualification.

For the construction phase, at least four audits per year must be undertaken where at least one is external.

External audits must be conducted by a suitably qualified auditor who is not part of the project or asset management team. They may be from a parent company, a client, or a third party. Management System accreditation audits can satisfy this credit. A combination of different external audits (and auditors) can be used but the results of all previous audits should be made available to auditors in advance of audits to ensure continuity of knowledge.

External audits may be undertaken by the same independent sustainability professional as described in Man-3 Developed Countries (Level 2). The individual would need to satisfy the requirements of both credits in order to undertake both roles.

Sustainability audits need to cover environmental and social issues. By way of example, social issues could include community complaints, stakeholder participation and community sponsorships. The scope of the audits may vary but it is important that the most Material issues are audited regularly during the rating period. Environmental audits should cover the most Material environmental issues and sustainability audits should cover the most Material environmental, social and economic issues. ‘Regularly’ needs to be described and justified for each project. The audit reports must demonstrate that these requirements have been fulfilled.

An establishment period at the start of the design or construction stages may be necessary for establishing management systems. Audits do not need to be undertaken during this establishment period but the length of the period needs to be justified and be no longer than 6 months.

Check online ISCA Guidance Repository for latest approved references.
DEVELOPING COUNTRIES

Man-4 - Management System Accreditation

Aim

To reward the adoption of accredited management systems that support sustainability.

Criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project or asset management systems have accreditation to: ISO14001 (Environment) ISO9001 (Quality) or equivalent</td>
<td>The requirements for Level 1 are achieved AND The project or asset management systems have accreditation to OHSAS18001 (OH&amp;S) or equivalent</td>
<td>The requirements for Level 1 are achieved AND Internal sustainability inspections of site management are undertaken at least monthly during construction. AND Sustainability audits of the management system are conducted. At least one external review or audit is conducted during design. AND During construction at least two audits are conducted per year where at least one is external.</td>
</tr>
<tr>
<td>Accreditation certificates.</td>
<td>Evidence as for Level 1</td>
<td>Evidence as for Level 2 AND Summary of scheduled and completed inspections and audits. Sample of internal inspection reports. Audit reports. Auditor qualifications.</td>
</tr>
</tbody>
</table>

Additional Guidance

Developing Countries have the option to use this credit or Credit Man-4 for Developed Countries. Management system accreditation must have been in place for the entire duration of the relevant rating phases and certificates should cover this period. For example, for the As-Built Rating, certificates should cover the design phase and the construction phase (a number of certificates are acceptable as long as there is continuous coverage). Projects may be managed under an accredited parent or client organisation’s management system but where this is the case, project...
management documents must state this. In these circumstances, parent organisations must have audited the project at least annually or at least once for projects which are shorter than one year in duration.

- **ISO14001:** “ISO14001:2015 Environmental Management” sets out the criteria for an environmental management system and can be certified to. It maps out a framework that a company or organization can follow to set up an effective environmental management system. It can be used by any organization regardless of its activity or sector (ISO14001:2015). Version 2015 of ISO14001 is the current one. Other versions of ISO14001 certifications are acceptable as long as they are still valid. ISO14001 validity period is 3 years, therefore by 2018 all ISO14001 certifications will need to be updated to the 2015 version.

- **ISO9001:** “ISO 9001:2015 Quality Management” sets out the criteria for a quality management system and can be used by any organization, large or small, regardless of its field of activity. In fact, there are over one million companies and organizations in over 170 countries certified to ISO 9001. This standard is based on a number of quality management principles including a strong customer focus, the motivation and implication of top management, the process approach and continual improvement. Using ISO 9001:2015 helps ensure that customers get consistent, good quality products and services, which in turn brings many business benefits (ISO9001:2015).

- **OHSAS18001:** “OHSAS 18001:2007 Occupational health and safety management systems” is an internationally applied British Standard for Occupational Health and Safety Management Systems. International Standard ISO45001 – Occupational Health and Safety is currently is being developed and it will take into account international and local standards including OHSAS18001, the International Labour Organization's ILO-OSH Guidelines, various national standards and the ILO's international labour standards and conventions. Once this standard is released, project can demonstrated compliance with the OH&S aspect this credit using ISO45001 certification. For further guidance see ISCA guidance repository.

### Equivalent accreditation

Projects could demonstrate compliance with this credit by providing evidence of meeting Environmental, Quality and OH&S requirements of other internationally or locally recognised standards and / or guidelines. For example, they can meet this credit by providing proof of funding from IFC and issuing a progress report directed to IFC against IFC’s Environmental Health and Safety Guidelines. See ISCA guidance repository.

### Inspections

The criteria for inspections do not apply to the design phase.

Internal inspections must be undertaken by a manager or a sustainability or environmental professional. At least 90% of scheduled inspections must be completed during construction. Where works have ceased, inspections are not required but this must be clearly documented in the inspection schedule.

Sustainability inspections must use a checklist which covers environmental and social aspects and the inspection must be documented in a report. In practice, coverage of environmental and community issues meets this requirement.

### Audits

For the design phase, at least one external review or audit is required to meet the credit criteria.

Internal audits must be conducted by a suitably qualified auditor who is part of the project or asset management team. Suitably qualified means satisfying the competency requirements of ISO19011:2011 - Guidelines for auditing management systems, or equivalent. Evidence of competency could include completion of a
recognised training course and/or holding an Exemplar Global Auditor Qualification.

For the construction phase, at least two audits per year must be undertaken where at least one is external.

External audits must be conducted by a suitably qualified auditor who is not part of the project or asset management team. They may be from a parent company, a client, or a third party. Management System accreditation audits can satisfy this credit. A combination of different external audits (and auditors) can be used but the results of all previous audits should be made available to auditors in advance of audits to ensure continuity of knowledge.

External audits may be undertaken by the same independent sustainability professional as described in Man-4 (Level 2). The individual would need to satisfy the requirements of both credits in order to undertake both roles.

Sustainability audits need to cover environmental and social issues. By way of example, social issues could include community complaints, stakeholder participation and community sponsorships. The scope of the audits may vary but it is important that the most Material issues are audited regularly during the rating period. Environmental audits should cover the most Material environmental issues and sustainability audits should cover the most Material environmental, social and economic issues. ‘Regularly’ needs to be described and justified for each project. The audit reports must demonstrate that these requirements have been fulfilled.

An establishment period at the start of the design or construction stages may be necessary for establishing management systems. Audits do not need to be undertaken during this establishment period but the length of the period needs to be justified and be no longer than 6 months.

Check online ISCA Guidance Repository for latest approved references.
Man-5 Reporting and Review

Aim

To reward regular, comprehensive and transparent sustainability reporting and review.

Criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benchmark</strong></td>
<td><strong>Level 1</strong></td>
<td><strong>Level 2</strong></td>
</tr>
<tr>
<td>Sustainability performance is reported at least annually to senior management. AND The sustainability report includes sustainability objectives and/or targets and identifies areas for improvement. AND Sustainability performance is reviewed formally at least annually by senior management.</td>
<td>The requirements for Level 1 are achieved. AND Sustainability performance is reported at least quarterly to senior management.</td>
<td>The requirements for Level 2 are achieved. AND Sustainability performance is reported annually publicly. AND Management review incorporates stakeholder participation.</td>
</tr>
<tr>
<td><strong>Evidence</strong></td>
<td><strong>Level 1</strong></td>
<td><strong>Level 2</strong></td>
</tr>
<tr>
<td>Sustainability reports. Minutes of management review meetings.</td>
<td>Evidence as for Level 1.</td>
<td>Evidence as for Level 2. Evidence that sustainability reports are made public. Minutes of stakeholder meetings showing input to management review.</td>
</tr>
</tbody>
</table>

Additional Guidance

**Sustainability Reporting**

The Global Reporting Initiative (GRI) provides a framework for producing corporate sustainability reports. The GRI Guidelines can be used by organisations for measuring and reporting on the economic, environmental, social, and governance dimensions of their activities, products and services.

A supplement to the GRI for the construction and real estate sector has also been released. Sustainability reporting must be specific to the project or asset and cannot be ‘rolled up’ into a parent organisation corporate sustainability report except where relevant project details (including objectives or targets, and indicators) are reported as a separable subset.

**Developing Countries**

For Level 1, progress reports issued to financial institutions (e.g. World Bank or Asian Development Bank) could be issued as evidence in lieu of sustainability reports, provided they include reporting on sustainability objectives and/or targets.

**Management Review**

Management review is an opportunity for management to take a holistic and strategic look at the continuing suitability, adequacy and effectiveness of the management system, and approve actions to improve the system, thereby reducing exposure to risk and improving performance. Where management review identifies the need for action, improvements and/or changes should be made to the management system or the project/asset.
Stakeholder participation in management review should include discussion of sustainability objectives or targets, and indicators; discussion of sustainability performance; discussion of actions to improve performance; and opportunity for stakeholder input to revision of objectives or targets and actions. All key stakeholders (as identified by stakeholder analysis or similar) should be represented in the management review process.

A simple management review template is provided in the Australian Government EMS Tool (see ISCA guidance repository), which can be used in the absence of a local tool.

**Small Projects**

Neither of the Level 1 or Level 3 criteria relating to management review need to be addressed. Where the project is within a larger program or project, the Level 2 and Level 3 criteria can be met at a program level (rather than for the individual small project). For this to apply the larger program or project must not be registered for an IS rating.

Check online ISCA Guidance Repository for latest approved references.
## Man-6 Knowledge sharing

### Aim

To reward sustainability knowledge sharing initiatives.

### Criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability knowledge is shared within the project.</td>
<td>The requirements for Level 1 are achieved.</td>
<td>The requirements for Level 2 are achieved.</td>
</tr>
<tr>
<td><em>(minimum of one example)</em></td>
<td>AND Sustainability knowledge is shared beyond project boundaries to parent organisations and/or other key stakeholders.</td>
<td>AND Sustainability knowledge is shared beyond project and key stakeholder boundaries to the wider industry.</td>
</tr>
<tr>
<td></td>
<td>AND Sustainability knowledge is shared from outside the project onto the project.</td>
<td>AND Sustainability knowledge sharing includes 'lessons learned' (that had negative consequences) as well as 'good practices'.</td>
</tr>
<tr>
<td></td>
<td><em>(minimum of two examples)</em></td>
<td><em>(minimum of three examples)</em></td>
</tr>
</tbody>
</table>

### Evidence

- An example of sustainability knowledge sharing.
- Evidence as for Level 1. Documentation of sharing knowledge with parent organisations and/or key stakeholders e.g. presentations, briefing notes and meeting minutes.
- Evidence as for Level 2.

### Additional Guidance

This credit recognises effectively capturing, distilling and sharing sustainability knowledge on projects/assets, and also beyond project/asset boundaries. Knowledge sharing is crucial to ensuring organisational and industry-wide sustainability knowledge from a diverse range of sources is captured, shared and built upon. This creates intellectual capital and facilitates a faster and more efficient cycle of new sustainability knowledge creation and innovation.

In the early phases of a project, knowledge is more likely to be brought into a project from outside as this can be beneficial to the project and little knowledge has been developed by the project at this stage in any case. In the later phases of a project, knowledge is more likely to be developed by the project and shared externally.

A knowledge sharing process might commonly be known as a 'lessons learned' process or similar. For all levels, examples of sustainability knowledge sharing must be provided. These may cover one or more of environmental, social or economic aspects.

Each criterion within each benchmark level must be demonstrated by at least one example of knowledge sharing.

**Level 1**

This requires one example regarding knowledge sharing within the project/asset. This might consist of reports, memos, intranet pages, photos/minutes from sustainability morning teas, or notes.

**Level 2**

...
In addition to the Level 1 requirement, this requires examples of knowledge sharing (i) from the project/asset to parent organization and/or other key stakeholders, and (ii) from outside the project/asset onto the project/asset. This could include knowledge from other projects/assets, peak bodies or working groups. Examples might consist of papers, meeting minutes, presentations and reports. The knowledge sharing examples must include at least one simple cost benefit case study associated with applying the rating scheme or one simple cost benefit case study for a sustainability related initiative. Examples of these case studies are provided on the ISCA website.

Level 3

In addition to the Level 2 requirements, this requires examples regarding knowledge sharing (i) with the wider industry, and (ii) one example of a lessons learned (that had negative consequences) shared with wider industry. This could include industry organisations, competitors, suppliers, customers, the community and government. This might consist of presentations, reports or journal articles.

While a single example of knowledge sharing can be used to address more than one relevant criterion, for Level 1 a minimum of one example of knowledge sharing must be provided, for Level 2 a minimum of two unique examples (in total), and for Level 3 at least three (in total).

Small Projects

The minimum number of examples does not apply, nor does the sharing of lessons learned under Level 3.

Where the project is within a larger program or project, all of the criteria may be satisfied at the program (or larger project) level. For this to apply the larger program or project must not be registered for an IS rating.

Check online ISCA Guidance Repository for latest approved references.
Man-7 Decision Making

Aim

To reward incorporating sustainability aspects into decision making.

Criteria

<table>
<thead>
<tr>
<th>Benchmark – Developed Countries</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
</table>
| For significant issues, decision making is characterised by: Considering options including business as usual and proven approaches taken in comparable situations.  
AND Evaluating options primarily on the basis of financial aspects but considering environmental, social and economic aspects qualitatively through risk assessment, constraint analysis or other non-scored means.  
AND Evaluating options based on the forecast useful life of infrastructure asset. | For significant issues, decision making is characterised by: Considering options including business as usual and proven approaches taken in comparable situations.  
AND Evaluating options by considering environmental, social and economic aspects through the use of multi-criteria analysis or other scored means.  
AND Evaluating options based on the forecast useful life of infrastructure asset. | For significant issues, decision making is characterised by: Considering options including business as usual, non-asset, technical limits and an option that specifically aims to address sustainability aspects.  
AND Evaluating options by considering environmental, social and economic aspects through incorporating their value into cost-benefit analysis or other quantified means.  
AND Evaluating options based on the forecast useful life of infrastructure asset and using social rates of return for discounting. |
| Evidence as for Level 1. | Evidence as for Level 1. | Evidence as for Level 1. |

Additional Guidance

Incorporating sustainability aspects into decision making is fundamental to achieving sustainability outcomes on projects or for asset management. Decision making is applied to numerous large and small decisions made throughout the infrastructure asset lifecycle, but it is on the most significant decisions where the scope and impact is greatest. This credit explores the approach to decision making for these significant decisions.

In addressing this credit, significant issues relevant to the project/asset need to be identified and then all significant issues need to be addressed. This may be evidenced through a decision making procedure, opportunities register, initiatives register, management guidelines etc.

Decision making involves generating, analysing and evaluating options. In any significant decisions, in order to achieve sustainability outcomes, an appropriate and wide range of
options should be considered. A wide range provides opportunity for innovation, lateral thinking and for exploration of options that may better address sustainability aspects.

For Level 1 and 2, the options analysed must include at least a business as usual (BAU) option and proven approaches taken in comparable situations. For Level 3, the options must also include a BAU option, a non-asset option (i.e. one that uses no capital), an option at the technical limits and an option that specifically aims to address sustainability aspects. An option at the technical limit would not have been applied before in this situation. An example of an option aiming to address sustainability aspects could be a ‘low carbon’ option. If one or more of these options simply cannot be identified, then suitable justification must be provided.

Evaluating options involves comparison of options and then selection of the most suitable option on the basis of certain criteria.

**Level 1**

Options are evaluated primarily on the basis of financial aspects but there must be consideration of environmental, social and economic aspects qualitatively through risk assessment, constraint analysis or other non-scored means. The evaluation must consider the forecast useful life of the infrastructure, rather than take a narrow view of just operating or capital costs and benefits. The forecast useful life of the infrastructure asset is defined to be the original or reforecast design life i.e. the length of time for which it has been designed and built or projected to function until.

**Level 2**

Options must be evaluated by considering environmental, social and economic aspects through the use of multi-criteria analysis or other scored means. Other scored means might include Cost Effectiveness Analysis. The evaluation must consider the forecast useful life of the infrastructure, rather than take a narrow view of just operating or capital costs and benefits. The analysis must incorporate at least one sustainability (non-financial) criteria and the weighting of the non-financial criteria must be greater than 20% in total.

**Level 3**

Options must be evaluated by considering environmental, social and economic aspects through incorporating their value into cost-benefit analysis or other quantified means. Other scored means might include Cost Effectiveness Analysis. The evaluation must consider the forecast useful life of the infrastructure, rather than take a narrow view of just operating or capital costs and benefits. The analysis must incorporate at least one sustainability (non-financial) criteria and the weighting of the non-financial criteria must be greater than 20% in total.

**Developing Countries**

Developing Countries are encouraged to consider environmental, social and economic aspects defined as critical through the UN Sustainable Development Goals Index and Dashboards during the decision making process.

Check online ISCA Guidance Repository for latest approved references.
Man-8 Capacity Building and Workforce

Aim

To reward long-term capacity building, skilling and increasing the diversity of the workforce.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A Capacity building and workforce policy is developed AND A project wide skills analysis is undertaken AND A resource plan is developed and implemented AND Employment targets for defined diversity groups are identified and reported publicly on an annual basis.</td>
<td>The requirements of Level 1 are achieved AND Talent and skills gaps are identified and action plans are implemented AND Training/learning and development plans must be developed and identify project-specific training requirements and timelines. AND Strategy and initiatives in place to support current local recruitment and inspire future talent into infrastructure careers. AND Targeted programs delivered that include attracting, recruiting, developing and retaining defined diversity groups.</td>
<td>The requirements of Level 2 are achieved AND Dedicated personnel to support training/learning and development and assessment, skills need and currency. AND Mentoring and other post-employment support programs provided to defined diversity groups. AND Implement internal and external awareness raising initiatives for diversity and inclusion</td>
</tr>
<tr>
<td>Evidence</td>
<td>Capacity policy Workforce policy Skills assessment Resource plan Employment report</td>
<td>Learning and development plan Recruitment strategy</td>
<td>Roles and responsibilities Organisational chart Project website Minutes</td>
</tr>
</tbody>
</table>

Additional guidance

One of the major barriers for infrastructure roll-out in regional and remote communities and in many developing countries is the availability of a skilled and readily available local workforce to cover design, construction and operational attributes of the project. More broadly local capacity of supporting business networks and supply chains can also be a barrier to successful and streamlined project planning, delivery and operations; an area which will benefit greatly from local economic development activities and support. Similarly, the project's governance arrangements and its institutional and private investors need due
diligence screenings and audit assurances and this area may also need development of local competencies.

Consequently, this credit seeks to reward and reinforce actions for long-term local capacity building, skilling and due diligence competences.

This credit also seeks to reward the improved diversity of the workforce. Diversity groups should include:

- Indigenous
- Women
- Young people
- Culturally and linguistically diverse
- Carers
- Disability
- LGBTI
- Mature Age
- Refugees

**Level 1**

A local capacity building policy must be developed covering:

- Skills gaps objectives
- Training requirements and objectives

A skills analysis must be undertaken for the project, including:

- Comparison of skills against project phase deliverables to identify possible gaps and shortages
- Skills and competency matrix developed for relevant occupation groups. The matrix must include the following:
  - Actions, measures and timelines to achieve defined outputs.
  - Identification of mandatory license, training and certification requirements
  - Minimum levels of time-based experience and re-certification demands (as required).

A project employee or workforce resource plan must be developed, and include occupation groups, number of employees per occupation group and competency and licensing that reflect all stages of the project’s life cycle.

The employee or workforce plan should be updated at least once per year throughout the project’s life cycle and **must** align to recruitment and compliance policy activities.

Employment targets for diversity groups must be set, monitored and reviewed on an annual basis. It is acknowledged that not all diversity groups will have a target, therefore justification should be made as to which diversity groups were selected and how the target was created. The selected diversity groups and targets must be reflective of good-practice.

**Level 2**

Employee or workforce plans must include workforce need projections to enable proactive recruitments and associated activities to meet changing demands. Projections must cover the duration of the project as a minimum.

Talent and skills gaps must be identified and action plans developed to address identified skills gaps. Action plans must include the following as a minimum:

- Recruitment drives for graduates, apprentices and critical skills roles
- Internal mentoring and talent management demonstrated supporting employee development (job rotation, upskilling, secondments), with evidence that actions have been undertaken to meet agreed outcomes
- Monitoring of progress against plans must be demonstrated through evidence including progress reviews, secondments and job rotation

The Training Management Plan must be developed and include:

- the specific project phase scope
- workforce skills matrix
- training and associated qualifications to meet project-specific requirements

Strategies and initiatives must be in place to support local recruitment. For example’

- include local recruitment and future talent objectives within the Workforce Skills Plan.
• be engaged in skills fairs and university, local schools and apprenticeship events.
• develop and deploy careers programs, including school and tertiary education collaboration, work experience apprenticeships and graduate programs on the project.
• provide work experience for undergraduates on the project.

Programs must be implemented to increase employment of under-represented groups. These projects may include initiatives such as Indigenous pre-employment training.

Level 3
A project must have a learning and development management team dedicated to supporting business needs. The Learning and Development processes must be articulated and evidence must be shown that the employees understand the process.

Mentors must be available to project employees from defined diversity groups. For examples e.g. Indigenous, women in non-traditional trades.

Mentoring support should be reviewed at least annually and should include feedback from both the mentoree and mentor about the mentoring program.

Internal and external awareness raising initiatives must be implemented e.g. presence at diversity events, information on project website, dedicated training for senior management

Access must be provided to relevant professional, industry and peak body programs and events, e.g. Women in Engineering, Women in Construction.

Check online ISCA Guidance Repository for latest approved references.
SUSTAINABLE PROCUREMENT

Procurement is a key function to facilitate the delivery of sustainability objectives in the planning, design, construction and operation of infrastructure projects and assets. Tier 1 contractors typically spend 60-80% of the costs of a project with their extended supply chains. The achievement of many sustainability objectives for an infrastructure project or asset operation, as described in the economic, social and environmental categories of the IS rating scheme, requires the proactive engagement and contribution of suppliers at different tiers of the supply chains and at different stages of the project life cycle. This is particularly the case when considering emerging themes and opportunities such as the participation of Indigenous businesses, establishing social enterprises and mitigating adverse human rights and modern slavery impacts potentially embedded in project supply chains.

Procurement is defined by International Organization for the ‘activity of acquiring goods or services from suppliers (ISO, 2017). As shown in Figure 1 below, it is situated between the buying organisation and its supply chains and ensures that specified requirements are met through the selection of the best goods/services and suppliers and usually made explicit in an agreement or contract. Procurement thus plays a major role in ensuring that the supply chains delivers what the buying organisation needs, including sustainability requirements.

Sustainable Procurement

Procurement is called sustainable when it integrates requirements, specifications and criteria that are compatible and in favour of the protection of the environment, of social progress and in support of economic development, namely by seeking resource efficiency, improving the quality of products and services and ultimately optimising costs (United Nations Global Marketplace).

As defined in ISO20400: Sustainable Procurement Guidance, sustainable procurement (SP) defined as:

**Figure 1** Overview of the Role of Procurement
‘procurement that has the most positive environmental, social and economic impacts possible over the entire life cycle’. It ‘involves the sustainability aspects related to the goods or services and to the suppliers along the supply chains’ and ‘contributes to the achievement of organisational sustainability objectives and goals and to sustainable development in general’.

ISO20400 is the first international guidance standard on SP, published in April 2017. It was developed by 52 countries as well as major international organisations such as the UN Environment, the UN Global Compact, OECD and European Commission. It covers all areas of procurement (planning, sourcing, managing contracts – see Error! Reference source not found. below) and addresses most environmental, social and economic issues. This SP category is aligned to ISO20400 and has been designed to adapt its principles to the infrastructure sector.

In the context of the IS rating scheme, the SP category acts as a lever to use procurement to facilitate the delivery of other IS rating scheme category outcomes.

ISO20400 is the first international guidance standard on sustainable procurement, published in April 2017. It was developed by 52 countries across the globe as well as major international organisations such as the UN Environment, Global Compact, OECD and European Commission. It covers all areas of procurement (planning, sourcing, managing contracts – see Figure 2 below) and addresses all environmental, social and economic issues of sustainable development. This category is aligned to ISO20400 and has been designed to adapt its principles to the infrastructure sector.

ISEAL is the global membership association for sustainability standards. Their mission is to strengthen sustainability standards systems for the benefit of people and the environment. ISEAL has developed a set a Credibility Principles that represent the core values upon which effective standards are built.

These Credibility Principles are (see ISCA Guidance Repository for further information):

- Improvement
- Relevance
- Rigour
- Engagement
- Impartiality
- Transparency
- Accessibility
- Truthfulness
- Efficiency

Responsibility

Organisations usually have a team or department responsible for their procurement activity, sometimes called ‘purchasing’ or ‘sourcing’. Depending on the project, this function may be centralised, centre-led or decentralised. The procurement function is traditionally most active during the selection and selection of goods and/or suppliers, and less in the strategic planning area and the management of contracts.

It is important to note that the audience for this Category are all relevant individuals involved in the procurement activity as major decisions relating to procurement will often be taken by individuals outside of the procurement function e.g. designers, cost estimators, project directors and engineers.

Sustainable Procurement in infrastructure

In terms of SP, all industries are different. Key features of infrastructure project/assets are:

1. The importance of planning – Key decisions impacting sustainability issues in supply chains are taken by the infrastructure buying organisation, very early in the project. Tier 1 contractors may thus be constrained by proponent decisions that impact what they can or cannot do in terms of sustainability and the extent to which the procurement function can influence final outcomes.

2. Projects are different – There is no one ‘SP strategy’ for infrastructure projects. Each project will need to define its own tailored approach to achieve the sustainability objectives of the project/asset through procurement.

3. The structure of the supply chains – Tier 1 contractors are often large companies, whereas most of the Tiers
2, 3, etc. subcontractors are often small and medium enterprises (SMEs) supplying a large portion of goods and services; and in many instances, SME’s source their own goods from large Tier 1 suppliers.

**Flexible framework**

This SP Category does not prescribe what should be the sustainability objectives and outcomes of an infrastructure project/asset, as this should be defined in the sustainability strategy across each of the relevant categories of the IS rating scheme. Rather, the SP credits describe best practices and processes that will enable the project to use the power of procurement to achieve their sustainability objectives.

The requirements have been designed so that they can be applied to most project/asset sizes and stages of the project life cycle, which gives each project/asset the flexibility to apply them for its specific context and environment. It covers three levels:

**Pro-1** Impact assessment and sustainable procurement strategy

**Pro-2** Supplier assessment and selection

**Pro-3** Contract management

It is important to note that the SP Category includes the objective of mitigating material sustainability impacts in the supply chain as this is or should typically be included in the project's/assets sustainability objectives.

**Related categories**

All IS categories may require the management of supply chains to achieve their objectives.

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**Figure 2 – Typical procurement process and the role of the procurement team**

- **Plan**
  - Analyse needs
  - Consult stakeholders
  - Define strategy
  - Write specs, evaluation criteria, draft contract

- **Source**
  - Engage market
  - Evaluate offers
  - Clarification
  - Negotiation
  - Contract award

- **Manage**
  - Implement contract
  - Manage transaction
  - Manage contract and supplier performance
  - Drive continuous improvement
Pro-1 Impact assessment and sustainable procurement strategy

Aim

To reward the development of a tailored project procurement strategy that enables the achievement of the project sustainability objectives, through an impact / opportunity assessment.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>There is a commitment to sustainable procurement in the project’s governance framework. AND Prior to going to market, all material sustainability impacts risks in the project’s supply chains are assessed and mitigation options identified in collaboration with key internal stakeholders. AND For Developing Countries, as a minimum, the assessment should be carried out for the top 4 suppliers by cost.</td>
<td>The requirements of Level 1 are achieved. AND A management framework and strategy is in place to manage sustainable procurement across the project/asset phase(s). AND SMART sustainability objectives and related performance indicators, in line with the outcomes of the impact assessment, are included in project/asset’s procurement strategy.</td>
<td>The requirements of Level 2 are achieved. AND The impact assessment includes the identification of opportunities to create positive outcomes in the project/asset’s supply chain. AND The procurement strategy includes initiatives to create positive outcomes in the project/asset’s supply chain.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Sustainable procurement commitments included in project sustainability strategy, policies, procurement policies and procedures Formal commitments</td>
<td>The evidence for Level 1 AND Organisational chart showing SP processes, accountabilities and approval level steps Position Description(s) Governance and management frameworks Evidence showing SMART SP KPIs being included in governance and management frameworks</td>
<td>The evidence for Level 2 AND Evidence of processes to assess and identify new innovative, non-business as usual on the project/asset and broader supply chain opportunities Evidence of specific initiatives included in procurement strategy to create innovative, non-business as usual project/asset and broader supply chain opportunities</td>
</tr>
</tbody>
</table>

Additional Guidance

This credit aims to reward actions that implement the following principles:

- Embedding sustainability priorities into the procurement strategy, such that SP is a ‘must have’ rather than being a ‘nice to have’;
- Having SP approved by key stakeholders, thereby ensuring that they’re on board and are committed to achieve the project SP objectives; and
- Defining measurable targets – Because what gets measured gets done.
Commitments
For Level 1, a formal commitment for the sustainable procurement policy/framework based on the principles outlined above must be provided and approved by an appropriate level of senior management; and SP commitments should be readily accessible to internal and external stakeholders.

Impact Assessment
Sustainability impact and opportunities in supply chains must be undertaken as part of the risk and opportunity assessment and encompass three complementary activities:

- Identifying short, medium and long-term sustainability and assessing their criticality for the project;
- Integrating appropriate activities to mitigate these risks within the risk management process; and
- Implementing appropriate risk mitigation measures.

Risk assessment procedure, management frameworks and registers or similar must include potential and actual adverse sustainability impacts and potential opportunities related to the activities of suppliers, contractors, business partners or intermediaries throughout the entire supply chain.

As a minimum, the following risks and opportunities must be included as part of the risk and opportunity assessment:

Impacts:
- Human rights breaches in the supply chain, including modern slavery
- Environmentally damaging practices (such as disposing of chemicals in waterways during a manufacturing process)
- Labour rights such as grievance mechanisms and right to collective bargaining
- Fair competition
- Organisational governance and decision-making.

Opportunities:
- Supplier diversity (gender, indigenous, cultural, disability)
- Local employment
- Social enterprises

The impact and opportunity assessment must be used to identify material risks and opportunities that need to be considered. It is acknowledged that there will not be a risk mitigation action for each risk or opportunity identified above, however, risk and opportunities rated as ‘high’ should be included in the sustainable procurement strategy.

Assessing impacts and opportunities in extended supply chains
The impact and opportunity assessment must be used to identify material risks and opportunities that need to be considered. It is acknowledged that there will not be a mitigation action for each impact or opportunity identified above, however, impacts and opportunities rated as ‘high’ should be included in the sustainable procurement strategy.

Various approaches can be used to address impacts and opportunities in extended supply chains, such as:

- The life cycle approach: consists of assessing sustainability impacts associated with all the stages of a product’s life from-cradle-to-grave, for instance: raw material extraction, materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling.
- The life cycle costing aims to analyse all costs of a good or service including, Total Cost of Ownership (TCO), which includes:
  - Purchase price and all associated costs (delivery, installation, insurance, etc.);
  - Operating costs, including energy, fuel and water use, spares, and maintenance
  - End of life costs, such as decommissioning or disposal;
  - Positive or negative externalities which can be monetised, including:
For the organisation: costs and benefits of risks and opportunities i.e. the evaluation of costs associated with risk and opportunity mitigation and benefit realisation

For society: cost of environmental externalities and cost of social externalities (such as job creation or job losses).

Accountability

Appropriate (i.e. level of seniority or authority) accountabilities for the management of SP must be formalised and clear for key internal stakeholders (e.g. in an organisational chart and reflected in the position description of the accountable staff)

Accountability must be identified for each phase in the infrastructure life cycle within the realms of control and influence.

Management framework

For Level 2, The project/asset governance framework and management plans must clearly describe how SP issues will be managed. It is important to integrate sustainability into existing governance and procurement arrangements and not to develop a new/separate governance framework. Projects often have a specific entity or group of people providing governance oversight over the management of sustainability and procurement related issues. There should be a clear connection between how procurement is governed and how the project sustainability objectives will be achieved.

The governance framework should include the following SP aspects:

- Approved procurement strategy (including sustainability) and action plan.

A SP action plan should be developed by a multidisciplinary team and it must include the following elements:

- WHAT – Activities / tasks
- WHO – RACI (Responsible, Accountable, Consulted and/or Informed) or similar
- WHEN – Timeline
- HOW – Resources, budget

The SP action plan must have actions to mitigate impacts or implement opportunities as identified in the impact and opportunity assessment undertaken in Level 1.

SMART objectives

SMART (i.e. Specific, Measurable, Achievable, Realistic, Time-bound) goals and performance indicators related to SP must be integrated in the project strategy or management plan. There are several types of indicators that can be considered:

- Process indicators: related to the measurement and monitoring of progress towards the achievement of the procurement-related sustainability objectives, e.g. establishment of policy and procedures;
- Output indicators: related to the measurement of the outputs of the SP approach, e.g. the % of products certified from sustainable sources; GHG emissions avoided, number of new apprentices developed, spend with Indigenous or social enterprises.
- Outcome indicators: related to the sustainability performance of the project/asset. These indicators can be aligned to sustainability issues to enable the project to better monitor the impact of its sustainability practices e.g. the extent to which procurement process has integrated/considered project sustainability objectives; and
- Impact indicators: relating to material economic, environmental and social impacts that are positive/negative,
actual/potential, direct/indirect, short-term/long-term, intended/unintended social return on employment investment for long-term unemployed e.g. reduced crime rate; reduced recidivism, reduced mental health costs etc.

**Legacy**

For Level 3, the project/asset must show how it has considered on the positive legacy that the project can generate on the supply chain through the phases and how it will deliver on these outcomes. This may include procuring a dedicated renewable energy installation to meet the project’s carbon reduction objectives for the Operational Phase, and in the process contributing to the region’s renewable energy target; GHG emissions avoided, number of new apprentices developed; percentage of spend with Indigenous, SME or social enterprises.

Check online ISCA Guidance Repository for latest approved references.
Pro-2 Supplier assessment and selection

Aim

To reward the assessment and selection of suppliers, goods and/or services that fully contribute to achieving the project’s sustainability objectives, including the assessment and mitigation of material sustainability impacts in the supply chain.

Criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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<tbody>
<tr>
<td>Prior to going to market, strategies or action plans to mitigate material sustainability impacts relating to the specific goods and/or services to be procured are agreed, in collaboration with key internal stakeholders and in the context of the impact / opportunity assessment carried out in Pro-1. AND Sustainability objectives and expectations are proactively communicated to potential suppliers before going to market. AND Specific sustainability requirements for the goods and/or services to be procured are specified in tender specifications and supplier evaluation and selection criteria. <strong>For Developing Countries, at a minimum, the supplier assessment should be carried out for the top 4 suppliers by cost, as identified in Pro-1.</strong></td>
<td>The requirements of Level 1 are achieved. AND As part of the prequalification and/or tendering process, suppliers are required to demonstrate how they meet the sustainability objectives of the project/asset, including the sustainability supplier code of conduct or similar performance standards. AND Suppliers’ own sustainability capabilities (including goods &amp; services) are assessed, by a suitably qualified person or team, as part of the procurement process. AND Supplier contracts include relevant sustainability requirements (Objectives, KPIs, deliverables, performance reporting) and how non-compliance will be managed as part of the contract management process.</td>
<td>The requirements of Level 2 are achieved. AND Impact and opportunity assessment addresses the impact of procurement practices on the achievement of project/asset sustainability outcomes and impact supply chains. AND The market is engaged well in advance and suppliers are encouraged to provide innovative sustainability solutions that go beyond project sustainability objectives and which could have significant construction and/or operational and legacy outcomes. <strong>For Developing Countries, Level 3 is awarded when Level 2 is achieved.</strong></td>
</tr>
<tr>
<td>Evidence that goods and service categories to be procured with a high materiality impact have been identified and specific mitigation plans developed. Project/asset level sustainability performance standards developed and existing industry standards adopted, including specific environmental and Supplier signed code of conduct; or Signed letter acknowledging the projects sustainability requirements and code of conduct has been read and will be adhered to. Supplier capabilities requirements At least three major contracts demonstrating inclusion of</td>
<td>Policy outlining a commitment to reducing impact of procurement practices Evidence such as payment terms Register identifying positive and negative impacts as well as opportunities created Protocol for monitoring, measuring and reporting progress on achieving</td>
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</tbody>
</table>
Additional Guidance

Integrating sustainability into a contract requires the proactive and consistent consideration of sustainability objectives throughout the comprehensive procurement process, as shown in Figure 2.

Level 1

Sustainability impacts and opportunities can vary materially from one project/asset, good or service and from one supplier to another. Before going to market, the material sustainability impacts and opportunities relating to specific (see threshold definition) goods and services to be procured must be identified with key stakeholders. This process should leverage and build on the impact and opportunity assessment undertaken in Pro-1.

The project must send to the market clear signals that sustainability is going to be an important element of supplier selection and seek feedback from suppliers around the sustainability objectives and targets and how they can be achieved.

To provide the market and suppliers with adequate information and in certain instances, sufficient time to prepare and develop capabilities, good and services, Tier 1 contractors need to provide timely and appropriate communication on the project/asset's sustainability objective, KPIs and likely specifications.

The sustainability requirements for infrastructure projects are likely to be included in a number of procurement documents and depending on the phase. These include the following:

- Project/Asset sponsor Expressions of Interest and Requests for Proposals (RFP)
- Tier 1 Contractor (RFPs)
- Formal sustainability performance evaluation criteria established e.g specific weightings or % allocated to sustainability performance, or sustainability included in performance “score card” of similar.

It is essential that the sustainability requirements as outlined in the project/asset sustainability strategy and policy and in alignment with the outcomes of the impact assessment, are translated and carried through into project/asset procurement documentation.

Level 2

The purpose of supplier evaluation process is to gather information and assess the capability of suppliers to participate in tenders and deliver on the project/asset requirements. The main difference between the prequalification and tendering stages are:

- Prequalification usually focuses on general capabilities of the supplier to deliver expected outcomes, including sustainability; and
- Tendering usually focuses on the capacity and commitment of the supplier to deliver detailed and specific requirements, including those related to sustainability, for goods or services.
Basic sustainability requirements must be integrated into the prequalification and/or tendering process for all high-impact goods and services’ suppliers, and include, as a minimum:

- A sustainable procurement policy covering:
  - All relevant regulations and codes of behaviour; and
  - Material sustainability issues for the supplier’s industry e.g. logistics service provider (carbon, pollution) versus demolition services provider (noise, waste management);
- Sustainability management system, describing how the organisation implements and monitors its sustainability policy for its operations; and
- Sustainability credentials of products or materials when relevant, e.g. supplier of concrete or steel.

The prequalification and tendering process must require relevant suppliers (see thresholds definition) to acknowledge what is expected from them in terms of sustainability.

Projects often formalise their sustainability expectations in a code of conduct or similar. This document should ideally:

- Reflect the project’s values, principles, objectives and goals;
- Reflect the project’s commitment to sustainability;
- Addresses the three pillars of sustainability: environmental, social and economic considerations;
- Address key considerations of SP such as exercising due diligence, avoiding complicity and exercising influence in extended supply chains through purchasing power; and
- Explain how compliance with expectations (i.e. contract and Code of Conduct) will be monitored and enforced.

**Supplier capabilities**

Sustainability requirements identified for specific products and/or services’ through the impact assessment undertaken in Pro-1 must be integrated into the supplier evaluation and selection processes.

Some of the requirements above apply directly to products and/or services being purchased, whilst others might apply to the production and process methods used to deliver goods and/or services and others to the supplier organisation itself.

The supplier selection criteria must consider the relative weightings for economic and sustainability aspects (both social and environmental) based on the impact and opportunity assessment undertaken for the specified product or service, unless justification can be provided as to why this is not appropriate. The supplier selection process must assess a proponent’s ability to either mitigate impacts or implement opportunities as identified in the impact and opportunity assessment.

Integrating sustainability aspects into supplier evaluation procedure is one and the most effective means of ensuring sustainability risks and opportunities are incorporated into the procurement decision-making. The process to achieve this should be done in coordination with key internal stakeholders, in order to reflect practical and technical considerations.

Evidence for supplier capabilities requirements can include the following:

- Establishing minimum levels of acceptable performance such as ISO14001 certified, modern slavery policies and processes etc.
- Excluding undesirable features such as certain chemicals used in cleaning, products from high risk countries, materials with high embodied carbon etc
- Key Performance Indicators (KPIs) such as percentage spend on indigenous-owned businesses and social enterprises, carbon emissions, waste to landfill figure etc;
- Preference given to goods and services that have certifiable environmental and
social performance specifications and/or labels.

- Evaluation criteria to encourage sustainability innovation and for exceeding compliance with regulations of project/asset objectives; and
- Sustainability evaluation weightings percentages or mandatory levels of performance for specific categories.

**Supplier contracts**

Sustainability commitments and compliance management mechanisms must be written into the contract to ensure that the supplier is contractually bound to deliver them or improve their performance over time. If it is not possible to negotiate contractual commitments, the project must capture the supplier’s commitments to sustainability in a separate improvement plan or a memorandum of understanding.

It may be appropriate to include clauses that enable the project to increase its control over what happens in the supply chains, such as:

- Provision to assess/audit all parties involved in the supply chains;
- Obligations on the supplier to inform the project of any significant impacts in the supply chains e.g. breaches of environmental licence in production facilities;
- Minimum standards to be met by suppliers at lower tiers of the supply chains;
- Rights to terminate the contract for breaches of sustainability obligation;
- Overall project/asset sustainability objectives and KPIs;
- SMART sustainability performance requirements (objectives, KPIs, measures) for the specific contact, good or service; and
- Desirable sustainability performance standards for the project as a whole e.g. ISCA, IS rating, Green Star, etc. or pertaining to individual materials (ref. Materials Cat); and
- Performance reporting obligations.

**Supplier notification**

Notifications and/or debriefs must include sustainability elements when relevant, as this enables suppliers to understand where they should improve and sends a clear message to the market about the importance of sustainable business practices for the project.

**Level 3**

The project/asset must show that it has reflected on the impacts of its procurement practices on supply chains and how the project will avoid negative and encourage positive practices. Typical practices include:

- Contact structuring that excludes participation by disadvantaged, minorities etc.
- Long and late payments;
- Unrealistic delivery requirements;
- Overly aggressive price negotiations;
- Unfair competitive practices, penalties.

The aim of this credit is to reward projects and suppliers to continuously exceed/improve upon the sustainability objectives within their control/contract scope and submit innovative proposals and solutions which may be outside their contract scope, however could significantly enhance the sustainability outcomes of the project/asset and/or the supply chain and ongoing legacy benefits.

Improving sustainability capabilities in supply chain takes time, engagement with suppliers should go beyond contractual requirements to develop their capabilities. Suppliers must be proactively supported; this includes the whole supply base and strategic suppliers to build sustainability capabilities throughout the supply chain.

There are many ways to do this, from hands-off communication to hands-on collaborative partnerships. Examples include:

- Evaluation criteria: suppliers encouraged to provide their sustainability best offer in comparison to price, quality, etc.
- Negotiations: Sustainability is part of the negotiation agenda and suppliers
are pushed to improve the performance of their sustainability offer (e.g. ‘bid back’ practices).

- Contractual terms: Suppliers are contractually incentivised (financial and non-financial) to achieve performance above expected or agreed targets.
- Public communication channels with suppliers, e.g. the project’s website, local newspapers, newsletters or annual reports;
- Industry forums: organising events where the project and its suppliers can exchange information, ideas and learn on how to achieve sustainability objectives together;
- Capacity building programmes: offering training to suppliers; organising workshops with suppliers, etc.;
- Supplier development: providing individual technical and/or financial support to suppliers to develop their sustainability capabilities over time;
- Supplier relationship management (SRM) initiatives: developing structured relationships with critical/strategic suppliers in order to achieve greater levels of sustainability benefits and innovation.

Evidence for market engagement can include:

- Evidence of early engagement with suppliers on sustainability e.g. emails, meeting agendas and minutes, industry briefing, market sounding;
- Extracts of communications with suppliers e.g. website screen shots, newsletter, annual report;
- Industry forums agendas, minutes and attendance lists;
- Supplier attendance/subscription to learning program;
- Training agenda and attendance list; and
- Supplier development plans, agendas, meeting minutes.

Check online ISCA Guidance Repository for latest approved references.
Pro-3 Contract Management

Aim

To reward the management of suppliers throughout the contract to ensure compliance with the sustainability requirements of the project/asset and contract.

Criteria

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<thead>
<tr>
<th>Benchmark</th>
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<th>Level 3</th>
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<tbody>
<tr>
<td>Supplier compliance with SMART sustainability objectives, KPIs and deliverables is monitored and reported internally throughout the contract. AND Feedback on sustainability performance is provided to suppliers as part of contract management.</td>
<td>The requirements of Level 1 are achieved. AND Non-compliance is managed and where possible alternative approaches are negotiated to achieve the project/assets sustainability objectives, KPIs and deliverables.</td>
<td>The requirements of Level 2 are achieved. AND The broader sustainability outcomes, including impacts (positive and negative) in supply chains are measured and reported publicly.</td>
<td></td>
</tr>
<tr>
<td>For Developing Countries, as a minimum, the supplier contract management should be carried out for the top 4 suppliers by cost, as identified in Pro-1.</td>
<td>Evidence as for Level 1. Evidence showing how non-conformity or changing circumstances were managed.</td>
<td>Evidence as for Level 2. Evidence of processes to assess and measure broader social and environmental outcome and benefits of new innovative procurement approaches. Evidence of public reporting.</td>
<td></td>
</tr>
<tr>
<td>Supplier performance requirements Contact management system and processes Supplier monitoring evidence and reporting Supplier sustainability performance reports detailing any non-conformances and acknowledging good performance Evidence of communication of non-conformities to the suppliers Feedback to contractors on sustainability performance Non-confirmance notifications to suppliers</td>
<td>Evidence as for Level 1. Evidence showing how non-conformity or changing circumstances were managed.</td>
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</tbody>
</table>

Additional Guidance

This Credit focuses on the management of supplier sustainability obligations contained in the contract and as part of the contract management process. Typically, the management of sustainability issues as part of the contract is difficult to implement and requires well-developed procurement capabilities and for SMART sustainability objectives, KPIs and deliverables to have been properly defined in the supplier evaluation and selection process and adequately provided for in the contract documentation.
Level 1
SMART sustainability objectives, KPIs and deliverables must be included in the generic contract management systems for the duration of the rating.
It is accepted that the KPIs and specific may vary from the start of the project. Regardless the overall objectives must remain consistent.
The ability of the procurement function also relies on suppliers reporting performance, including on sustainability performance, in keeping with contractual obligations.
Feedback on the implementation of sustainable procurement must be provided to suppliers in a timely and constructive manner. This should be carried out on a regular basis and as part of the normal contract management process.
Feedback should be prepared in response to any specific incident and/or following receipt of a suppliers performance report.
Level 2
Non-compliances regarding sustainability performance must be actively managed with each supplier individually.
The management of non-compliances should be structured and address specific sustainability KPIs. The focus of this engagement is to encourage the supplier not to repeat the non-compliance and support should be provided for them to meet this goal.
In circumstances where the project/asset operating environment has changed, there is likely to be scope to engage with the supplier to consider alternative solutions to deliver equivalent or better outcomes. The ability of the procurement function to accommodate this in a timely manner is important in overcoming non-compliance and changing circumstances.
Level 3
Sustainability impacts (positive and negative) must be measured and reported publicly. Each relevant KPI, objective must be specifically referenced.
The information must be easily found and should be on the project website or other similar website.

A key sustainability objective of most infrastructure project/asset is, as a minimum, to mitigate the direct adverse sustainability impacts associated with the project/asset. However, it is also becoming more important, particularly for large, government sponsored projects (e.g. large transport projects) to mitigate and where possible to use the scale of the project to positively impact the border supply chain.

This can occur in several ways, for example:
- Engaging the market early on developing new innovative sustainability products and services that have the potential to significantly enhance environmental and social outcomes in the supply chain;
- Adopting social procurement practices that allow for greater participation of minority and disadvantaged groups in tendering process; and
- Participating in industry and non-government organisation initiatives to increase purchasing power/influence (e.g. buyer groups) for the adoption of internationally recognised environmental (deforestation, low carbon) and social (human rights) performance standards for key construction material (e.g. timber, steel).

Check online ISCA Guidance Repository for latest approved references.
RESILIENCE

About Resilience

Infrastructure can play a vital role in the resilience of our cities, towns and communities. This category seeks to consider how an asset can improve its resilience to a shock or stress event and explores the role infrastructure assets play in contributing towards the resilience of a city, town or community by considering the complex and interdependent systems that bind them together (Res-1). As climate and natural hazards are one of the biggest resilience risks for infrastructure projects and assets, a specific Climate and Natural Hazard Risk and Adaptation credit (Res-2) considers how assets can adapt to the changing climate and respond to existing natural hazard risks.

This category marks the inception of the transformational change required across industry to deliver infrastructure that is more resilient and responsive to the needs of our cities and communities. At its core, this category is about the sphere of impact and influence our infrastructure assets have and the inclusive approach to engagement required to respond to the needs of communities and key stakeholders in the face of shocks and chronic stresses.

The Lloyd’s City Risk Index found that $4.6 trillion of the projected Gross Domestic Product (GDP) of 301 of the world’s leading cities is at risk from 18 different types of shock events over the next decade (Lloyds, 2017). With cities needing to respond to an ever-evolving set of disparate and diverse risks, the need to plan and build resilient infrastructure to help communities respond and recover quickly in the face of change is becoming increasingly necessary.

A commonly used approach to resilience thinking, particularly in the context of infrastructure and urban systems, expands on the notion of maintaining functionality to consider how assets and systems might bounce back, and indeed bounce forward to create a ‘new normal’ in the face of a diverse range of shocks and stresses (Davoudi et al, 2012; Rockefeller Foundation, 2013; UNISDR, 2015; Lloyds, 2017).

This approach, considering resilience no matter the cause, focusses on improving the individual systems that make up a city and increasing the resilience of the city (and/or regional community) overall.

About Natural Hazards

For the purposes of this category, natural hazards are defined as a “natural process or phenomenon that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.” This definition has been informed by the Hyogo Framework for Action 2005-2015 (United Nations, 2005) and the Sendai Framework for Disaster Risk Reduction 2015-2030 (United Nations, 2015). Examples of natural hazards include bushfires, heatwaves, cyclones, extreme storms, wide-spread flooding and biological hazards like insect/animal plagues. Broader geological hazards such as earthquakes and tsunamis are also included.

‘Natural Hazards’ includes hazards resulting from climate change, as well as the natural hazards that are not associated with climate change (such as earthquakes) and those that are occurring now and into the future.

The UNISDR (United Nations Office for Disaster Risk Reduction) through the International Strategy for Disaster Reduction reflects a major shift from the traditional emphasis on disaster response to disaster reduction, and in effect seeks to promote a “culture of prevention.”
Between 1994 and 2013, EM-DAT recorded 6,873 natural disasters worldwide, which claimed 1.35 million lives or almost 68,000 lives on average each year. In addition, 218 million people were affected by natural disasters on average per annum during this 20-year period.

Reporting levels vary according to the continent, type of disaster and the national income. Such gaps in our knowledge should be of international concern at a time of limited financial resources and competing priorities.

The frequency of geophysical disasters (earthquakes, tsunamis, volcanic eruptions and mass movements) remained broadly constant throughout this period, but a sustained rise in climate-related events (mainly floods and storms) pushed total occurrences significantly higher. Since 2000, EM-DAT recorded an average of 341 climate-related disasters per annum, up 44% from the 1994-2000 average and well over twice the level in 1980-1989. The Human Cost of Natural Disasters 2015, A Global Perspective, CRED, UNISDR.

EM-DAT data show that storms are the most expensive type of disaster in terms of recorded lost assets (US$ 936 billion), followed by nothing in low income ones where insurance is beyond the reach of most people.

Under reporting of economic losses. Information on the economic damage caused by natural disasters is only available for 36% of disasters reported from 1994 to 2013. Records are particularly partial from Africa, where losses were reported from just 13% of events.


In 2016 the United Nations Office for Disaster Risk Reduction (UNISDR) commissioned the development of guidelines on national disaster risk assessment (NDRA) as part of a series of thematic guidelines under its “Words into Action” initiative to support national implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030.

A recent study released by the World Bank showed that if not properly mitigated, climate change could push more than 100 million people back into poverty over the next 15 years, hitting the poorest regions of the world – Sub-Saharan Africa and South Asia – the hardest.

The World Bank Group’s 2015 Annual Meetings announced an institutional commitment to increase climate-related investments by 28 percent by 2020, roughly doubling the IFC’s climate investments in the next five years.

Figure 1 Share of occurrence of natural disasters by disaster type (Source: The Human Cost of Natural Disasters 2015, A Global Perspective)
About the Natural Hazards Category

The Natural category is consistent with, and supportive of, international initiatives to make infrastructure more adaptable and resilient to the future impacts of climate and geological natural hazards.

The intent of the Natural Hazard category is to assess the appropriateness and effectiveness of measures undertaken to build the capacity for infrastructure assets to adapt and respond to increasing shocks and stresses.

The following credits comprise the Resilience category:

Res-1 Resilience
Res-2 Natural Hazard Risk and Adaptation

Related categories

The approach adopted in this category mirrors the approach to risk and opportunity assessment covered by the Management and Governance category. This category deals with natural hazard risk and adaptation.

Climate change mitigation and greenhouse gas (GHG) management is covered within the Energy & Carbon category and indirectly in the Materials category. Consumption of water resources, which in some cases are likely to become scarcer due to climate change, is dealt with in the Water category.

The Lan-4 credit in the Discharges to Air, Land & Water category considers the details of flooding and its impacts whereas this category covers broader climate change risks and their management. Nevertheless, flooding may be one of the risks identified in a climate change risk assessment so there may be some overlap.

External stakeholder engagement is relevant to Level 3 of Res-2. The details of how stakeholder engagement is undertaken are covered in the Stakeholder Participation category.
Res-1 Resilience

Aim

To reward the consideration and planning of the role an asset plays in contributing towards the resilience of a city, town or community.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Resilience Plan/strategy is developed and implemented AND Internal and external stakeholders are engaged as part of the development</td>
<td>The requirements of Level 1 are achieved. AND An expanded selection of external representatives participated in the identification of interdependent assets and services within the city/town/community. AND Identify the vulnerable communities at a local level likely to be most impacted in the event of the asset failing. AND Treatment options are extended to address impacts to vulnerable communities.</td>
<td>The requirements of Level 1 are achieved. AND Treatment options are prioritised based on their ability to deliver co-benefits across a range of interdependent assets and services and are implemented. AND Community feedback has informed the final Resilience Plan for the asset.</td>
<td></td>
</tr>
</tbody>
</table>

Evidence

Resilience plan
Workshop presentation and minutes

Evidence for Level 1
List of stakeholders
Meeting minutes
Resilience plan and report
Design reports

Evidence for Level 2
Additional Guidance

Definitions:

Engagement/participation means the involvement, through an appropriate means, of internal and external stakeholders that are directly or indirectly interested or affected by the infrastructure development. Appropriate engagement must include either:

- A face-to-face workshop with relevant representatives from stakeholder organisations
- A web conference with relevant representatives from stakeholder organisations
- Formal review of the draft resilience strategy with feedback provided either verbally or electronically

Timely and inclusive engagement with key stakeholders representing interdependent assets, services and communities is a critical component of the resilience process and one that distinguishes from a business-as-usual approach. While external engagement within the earlier stages of a project and within the lower levels of ISCA compliance is unusual, it is an essential component in developing a resilience approach that fully responds to the ability of the identified asset to contribute towards a community’s overall resilience.

Interdependent assets and services relate to those components of a city or a community likely to be impacted because of the identified asset failing or being forced to operate at minimal capacity. For example, if a water treatment plant is unable to function at capacity it may force other systems and services to be disrupted. An example of this was seen in 2013 when the Mt Crosby Treatment plant in Brisbane Australia was operating at minimal capacity as result of recent flooding. The impacts of this were far reaching with hospitals rescheduling elective surgeries and child care providers closing until service was re-established.

The Resilience Plan must include:

- Background and overview of the identified asset and context.
- Summary community engagement approach and how the feedback has informed the plan.
- Summary internal and external stakeholder engagement and how these suggestions have informed the plan.
- Analysis of relevant shocks and stresses highlighting those shortlisted prioritised;
- Analysis of interdependent infrastructure and services including condition and criticality.
- Analysis of impacts to vulnerable communities and their location within the community;
- Engagement with vulnerable communities and details of support for;
- Engagement, enhancement, and contribution to a multi-stakeholder collaborative approach for the implementation of longer-term measures that build resilience of vulnerable at risk people and communities, that are beyond the capacity of an individual project proponent (Res-1, Level 3);
- Details of all treatment actions within the Resilience Plan, including, timeframe for delivery implemented through the relevant phases of the project; responsibility; funding/cost implications and relevant stakeholders to support implementation.

Shocks refer to large-scale high impact events and catastrophes such as man-made and natural disasters. Example shocks could include: cyber-attack; digital network failure; terrorist attack; war and conflict, collapse of financial systems; natural disasters, widespread pandemics and/or diseases.

Stresses are often defined as the underlying ‘slow burn’ issues that have the potential to exacerbate a shock. Examples of stresses in the context of a city may include: social cohesion, housing affordability; access to transport; demand on health infrastructure; aging populations etc.
Level 1

A resilience plan must be developed and implemented which includes:

- Risk assessment
- Risk prioritisation
- Independencies
- Treatment options

(see bottom of additional guidance for more information).

A multi-disciplinary team comprising key internal and selected external project stakeholders must participate in identifying acute shocks and stresses likely to impact the functionality of the asset and its delivery to the community it services. Ideally, this would be undertaken early in the projects lifecycle but could be completed in the design phase.

Table 1 Example Shocks and Stresses

<table>
<thead>
<tr>
<th>Example shocks: short-term disruptions</th>
<th>Example stresses: long-term systemic disruptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>cyber-attack</td>
<td>diminishing social cohesion</td>
</tr>
<tr>
<td>digital network failure</td>
<td>homelessness</td>
</tr>
<tr>
<td>terror attack</td>
<td>increasing chronic illness</td>
</tr>
<tr>
<td>failure of critical infrastructure</td>
<td>increasing energy costs</td>
</tr>
<tr>
<td>war and conflict</td>
<td>increasing unemployment</td>
</tr>
<tr>
<td>collapse of financial systems</td>
<td>aging infrastructure</td>
</tr>
<tr>
<td>natural disasters including climate change and broader set of geological hazards e.g. landslides, earthquakes, tsunamis etc.</td>
<td>failure of urban planning</td>
</tr>
<tr>
<td>water crises</td>
<td>rising income and wealth disparity</td>
</tr>
<tr>
<td>widespread pandemics and/or diseases</td>
<td>profound social instability</td>
</tr>
<tr>
<td></td>
<td>rising cyber dependency</td>
</tr>
<tr>
<td></td>
<td>loss of housing affordability</td>
</tr>
<tr>
<td></td>
<td>lack of transport accessibility and availability</td>
</tr>
<tr>
<td></td>
<td>demand on health infrastructure and services</td>
</tr>
<tr>
<td></td>
<td>aging population</td>
</tr>
<tr>
<td></td>
<td>depleted or degraded natural resources</td>
</tr>
</tbody>
</table>
The following questions are designed to guide the process of selecting and assessing the relevant shocks and stresses for the project. It is important to note there is no minimum number of shocks or stresses that will be relevant, these are likely to be different for each project and asset type and as such it is important to consider and assess each of the potential impact areas individually.

**How likely is it that the shock will:**

- **Impacts to functionality:**
  - How likely is it that the shock will significantly constrain the identified asset’s ability to function and support the surrounding community for at least a month?
  - How likely is it that the shock will constrain the ability of the identified asset to function for between one week and one month?

- **Injury and loss of life:**
  - How likely is it that the shock will result in loss of life or injury by asset employees or members of the community?
  - How likely is it that the shock will result in isolated loss of life or injury by asset employees or members of the community?

- **Economic growth and activity:**
  - How likely is it that the shock will result constrain the identified asset’s contribution towards regional activity and growth for at least 6-months
  - Constrain the identified asset’s contribution to regional activity and growth for up to 6-months

**Note:** completing Res-2: Climate and Natural Hazards will assist the process of identifying climate-related shocks and stresses. These outputs will contribute (in part) towards meeting the requirements of this credit and should be used to inform the broader process of identifying appropriate shocks and stresses.

**Defining likelihood:**

The following clarifies the anticipated likelihood of the shock event occurring. All shocks considered likely or very likely to relate to the project should be considered.

- **Very likely** – The shock is expected to occur (>70% probability over the lifetime of the asset)
- **Likely** - The shock could occur (30 – 70% probability over the lifetime of the asset)
- **Unlikely** - The shock is unlikely, but could potentially occur (<30% probability over the lifetime of the asset)

**Identifying relevant stresses**

To identify the relevant stresses for a project the following question should be reviewed against a selection of at least 10 of the shocks listed in Table 2 and assessed for relevance.

“Does the identified asset provide an opportunity to reduce the impact of the associated stress?”

- **Possibly:** It is possible the asset will provide an opportunity to reduce the impact of the associated stress.
- **Unlikely:** It is unlikely the asset will provide an opportunity to reduce the impact of the associated stress.
If the answer is ‘possible’, then it should be considered as a relevant stress for the identified asset.

Example: Assessing stresses for a new train station

Does the identified asset provide an opportunity to reduce the impact of the associated stresses?

Answer: Possibly – it is possible the asset will provide an opportunity to reduce the impact of:

- **transport accessibility and availability** – by providing a service where none previously existed
- **unemployment** – by improving connectivity and enabling people greater access to employment opportunities

Answer: Unlikely - it is unlikely the asset will provide an opportunity to reduce the impact of the associated stress.

- **Homelessness**: it is unlikely the asset will provide an opportunity for reducing the impact of homelessness on the community
- **High energy costs**: it is unlikely the asset will provide an opportunity for easing the impact

Level 2

People-centred decision-making is a key attribute of resilience practice, as such, engagement with external stakeholders must be expanded from local council representation to include other tiers of state or federal government and include a selection of business and community stakeholders. An example of relevant stakeholders includes:

- First responders such as State Emergency Services, Fire, Police, Ambulance
- Impacted infrastructure providers such as roads, transport services
- Key community support agencies (e.g. Red Cross; Salvation Army etc.)

When infrastructure assets fail the impact is often felt across a whole community, and at times even at a city-scale. Within these communities however it is often the vulnerable and sensitive members of society who have the least capacity to respond these disruptions and least ability to cope (adaptive capacity).

As part of external engagement efforts aligned with level 1, engagement with relevant external stakeholders must be expanded from identifying interdependent assets and services, to identify those vulnerable members of the community likely to be impacted and disadvantaged in the event of the asset failing.

Vulnerable members of the community should include, as a minimum (Griffith University, 2017):

- People for whom English is a second-language (Culturally and Linguistically Diverse)
- Above 65 years and living alone.
- Full dependent (4 years and under)
- People with physical and mental health problems
- Those earning lower than the median household income average (below $750 per week)
- Those experiencing financial hardship and distress; renters and/or people in social housing.

Treatment options must be expanded to reduce the negative impact to vulnerable members of the community that may arise in the event of the identified asset failing or operating at minimal capacity.
As an example, if service along a train line is suspended due to a shock event, what impact might that have on vulnerable community members? As a minimum, in this instance the project should consider if there aged care homes or retirement villages within close proximity to the impacted stations which may result in elderly members of the community unable to access health or support services. It should also consider whether there are local schools or childcare centres within close proximity of the line that may result in children/dependants being stranded as parents or guardians are unable to collect them. Once these potential vulnerable communities have been identified, the project team must engage with the managers of these facilities to identify appropriate treatment options to manage the impacts of this disruption.

Level 3

Identifying associated co-benefits supports the delivery of the resilience dividend and assists with decision-making, resourcing and prioritisation. The treatment option assessment must analyse and prioritise options based on their ability to deliver co-benefits.

While a treatment options may address or respond to several resilience qualities at a time, it does not necessarily follow that it will deliver a solution for multiple issues. E.g. an emergency evacuation plan could be developed to address multiple shocks and therefore provide multiple benefits (co-benefits). In contrast upgrading the HVAC system within a train station to respond to the stress of increased temperatures may respond qualities associated with being ‘reflective; robust and redundant’, but is unlikely to deliver broader benefits beyond those using the station.

Those treatment options that deliver a greater number of co-benefits should be prioritised for implementation. Further prioritisation can assist with identifying and allocating delivery timeframes for response and funding the associated initiatives. As a minimum, treatment options must be prioritised based on their ability to deliver the greatest proportion of risk reduction to affected people and communities.

The identified and prioritised treatment options along with responses for each level of this credit must be consolidated into a draft Resilience Plan and the community should be engaged on the draft.

Consultation might include online publication; community consultation sessions and; group consultation as a minimum with key stakeholders.

Consultation approaches for community engagement should reference the requirements outlined in Sta-1 and Sta-2 regarding Stakeholder Engagement. Evidence must be provided to show how a Diverse, Influential and Representative sample of the community has been consulted and engaged.

General

Risk Prioritisation.

The risk identification (likelihood and consequence) associated with the shock and its subsequent prioritisation, must follow a recognised risk management standard and framework, such as ISO 31000. Country specific and client specific risk management guidelines, tools and requirements are likely to apply to the infrastructure project. Project team should consult with ISCA over the selected risk management framework.

It is important to note there is no minimum number of shocks or stresses that will be relevant, these are likely to be different for each project and asset type and as such it is important to consider and assess each of the potential impact areas individually. Business continuity planning will typically cover the shock’s impact on:

- The asset’s functionality and support to the surrounding community
- Injury and loss of life to employees or members of the community
- The asset’s contribution to economic growth and resulting constraint

In addition to the requirements listed above, a high-level community context analysis is to be undertaken at a relevant scale (e.g. regional,
metropolitan, city/local government area, and precinct) for the project outlining the current state of the community the asset is passing through and servicing.

As a minimum, community information considered must include:
- Population demographics
- Social stability, security and justice
- Economic prosperity
- Public health
- Education and employment

**Interdependency**

A preliminary desktop assessment should be undertaken to identify key assets and services likely to be affected as a result of the asset’s failure. At a minimum, assets considered must include: water, power, telecommunications, transport, parks and community facilities.

A summary of the location and/or the proximity of the interdependent assets/services to the identified assets and services must also be stated. This list must then be tested with external stakeholders during the consultation workshop or similar engagement method.

Interdependencies generally fall into three categories of interaction namely, upstream, internal or downstream and each category of interaction can include one or more of four classes of dependency, including physical, cyber, geographic or logical (Rinaldi et al. 2001). These categories and classes of dependencies are summarised in Table 5.

**Table 2 Dependency types (Source: Rinaldi 2001)**

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category of dependencies</strong></td>
<td></td>
</tr>
<tr>
<td>Upstream dependencies</td>
<td>The products or services provided to one infrastructure by another external infrastructure that are necessary to support its operations and functions</td>
</tr>
<tr>
<td>Internal dependencies</td>
<td>The interactions among internal operations, functions, and missions of the infrastructure. Internal dependencies are the internal links among the assets constituting a critical infrastructure (e.g., an electric generating plant that depends on cooling water from its own onsite water well).</td>
</tr>
<tr>
<td>Downstream dependencies</td>
<td>The consequences to a critical infrastructure’s consumers or recipients from the degradation of the resources provided by a critical infrastructure.</td>
</tr>
<tr>
<td><strong>Classes of dependencies</strong></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>Infrastructure is physically dependent if the state of its operations is dependent on the material output(s) of another infrastructure through a functional and structural linkage between the inputs and outputs of two assets: a commodity (i.e., good or service) produced or modified by one infrastructure (an output) is required by another infrastructure for its operation (an input).</td>
</tr>
<tr>
<td>Cyber</td>
<td>Infrastructure has a cyber dependency if its state of operation depends on information and data transmitted through the information infrastructure via electronic or informational links. Outputs of the information infrastructure are inputs to the other infrastructure, and the commodity passed among the infrastructure assets is information.</td>
</tr>
<tr>
<td>Geographic</td>
<td>Infrastructure assets are geographically dependent if a local environmental event can create changes in the state of operations in all of them. A geographic dependency occurs when elements of infrastructure assets are in close spatial proximity (e.g., a joint utility right-of-way).</td>
</tr>
<tr>
<td>Logical</td>
<td>Infrastructure is logically dependent if its state of operation depends on the state of another infrastructure via a mechanism that is not a physical, cyber, or geographic connection. Logical dependency is attributable to human decisions and actions and is not the result of physical or cyber processes.</td>
</tr>
</tbody>
</table>
Following identification of the interdependent assets and services a high-level summary of the current condition and level of criticality of interdependent assets and services should also be identified.

Treatment options must reduce the negative impact to vulnerable members of the community that may arise in the event of the identified asset failing or operating at minimal capacity.

**Treatment Options**

Business continuity treatment options must address the impact of the shock or stress on the asset and its interdependencies must be identified in consultation with relevant stakeholders and explicitly provide for the optimal timing of the treatment, e.g. planning, design, construction, and operation.

Check online ISCA Guidance Repository for latest approved references.
Res-2 Natural hazard risk and adaptation

Aim

To reward the assessment and treatment of risks associated with natural hazards and climate change.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A review of climate and natural hazard risks is completed using readily</td>
<td>The requirements of Level 1 are achieved.</td>
<td>The requirements of Level 2 are achieved.</td>
</tr>
<tr>
<td></td>
<td>available and current natural hazard data and climate change projections for all direct risks to the asset.</td>
<td>AND</td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td>The natural hazard risk assessment also considers indirect risks to the asset.</td>
<td>Treatment options have been assessed and implemented considering the optimal scale and timing, and costs and benefits of addressing the climate and natural hazard risk.</td>
</tr>
<tr>
<td></td>
<td>Treatment options for direct risks are identified and implemented and after treatment there are no residual extreme and high priority direct risks.</td>
<td>AND</td>
<td>AND</td>
</tr>
<tr>
<td></td>
<td>AND</td>
<td>Treatment options for indirect risks are identified and implemented and after treatment there are no residual extreme and high priority direct or indirect risks.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A multi-disciplinary internal team participated in the identification and assessment of climate and natural hazard direct risks, including selection of treatment options.</td>
<td>Evidence for Level 1 includes indirect risk coverage</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
</tr>
<tr>
<td></td>
<td>Evidence for Level 1 includes indirect risk coverage</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
</tr>
<tr>
<td></td>
<td>Natural hazard and climate projection data.</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
</tr>
<tr>
<td></td>
<td>Multidisciplinary team direct risk identification, reassessed risk and adaptation selection workshop(s) minutes/report</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
</tr>
<tr>
<td></td>
<td>Natural hazard and adaptation risk management plan</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
</tr>
<tr>
<td></td>
<td>Design and As Built documentation with adaption measures to treat (at least) all extreme and high priority natural hazard risks</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
</tr>
<tr>
<td></td>
<td>Operational management plans for treatment measure requiring a management or governance response</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
<td>Evidence for Level 2 updated cost benefit analysis</td>
</tr>
</tbody>
</table>

Additional Guidance

For the purposes of this credit the following risk definitions apply:
Review of natural hazards risks

The assessment of natural hazard risks must include climate change related risks and risks associated with geological and biological impacts. Consideration must be given to an asset’s impacts and relationship to a local government region. As a minimum, any existing Local Government natural hazard and/or climate change management plans must be considered in the development of the natural hazards risk assessment.

For climate change projections, detail of the adopted projection including year, source etc. must be provided. As a minimum, the following climate change and natural hazards impacts must be considered in the natural hazard risk assessment process:

- air temperature,
- humidity,
- sea surface temperature,
- solar radiation,
- precipitation,
- sea level rise,
- wind,
- bushfire weather,
- coastal inundation,
- cyclones,
- flooding,
- heatwave,
- drought
- earthquakes,
- landslides
- tsunamis
- avalanches,
- volcanic activity
- biological hazards (disease epidemics, insect/animal plagues, algal blooms etc)

It is acknowledged that not all impacts will relate to all assets and therefore will not be included in the assessment process; where this is the case justification must be provided as to why certain impacts were excluded from the study.

It is expected that published natural hazard data (including climate change projections) for the asset’s region is adopted to inform the risk assessment process.

When assessing climate change risk, the latest climate change projections must be used. When identifying relevant climate variables, the scenarios used by the applicant should be sourced from IPCC endorsed Global Circulation Models (GCMs) and are likely to include Country and regional specific climate projections using more finer scaled climate modelling. If the forecast useful life for the asset is over 20 years, at least two time horizons must be selected and at least one must be beyond the end of the asset life. For example, if the life is 70 years, then 2050 and 2100 may be selected for assessment. If projections do not exist (eg. for an asset with a 100-year design life) then use the longest projections available. The Assessor must justify the selection of the emissions scenario/s and climate change projections used.

Treatment

Treatment measures associated with natural hazard risks can include:

- structural measures such as physical changes to the infrastructure to achieve or facilitate adaptation; and
- ‘non-structural’ measures, such as changes to maintenance contracts or implementing an emergency management plan.

The term adaptation and treatment can sometimes be used interchangeably. For the purposes of this credit, treatment includes adaptation and is the more appropriate word to summarise the ways various risks can be managed.

Treatment measures should also consider the optimal scale and timing of addressing the natural hazard risk, though understanding the design life of components and climate projections a stage approach to treatments maybe the most beneficial option over time.

Multi-disciplinary team

A multi-disciplinary team must participate in risk workshop(s) to identify natural hazard direct, indirect and flow on risks (depending on the level targeted). This should include risk managers, designers (e.g. with backgrounds in flooding, civil and structural design, corrosion, fire), asset operators and maintainers, environmental staff, and community relations staff as relevant. As appropriate the team may also include external project stakeholders such as government and client representatives, directly in workshops or by
document review/approval. The name, company and role title of each participant must be provided as evidence.

A multi-disciplinary team must also participate in the identification and selection of natural hazard adaptation actions. This may be as part of the risk identification process or separately through a specific reassessed risk workshop process.

For Level 3 a comprehensive set of affected stakeholders must be engaged in the direct and indirect identification and treatment option stages and include the following as a minimum:

- Government (local, state and federal as appropriate),
- infrastructure utilities,
- emergency services,
- affected and interested community groups, and
- other facilities and assets in the region.

Attendee names and titles as well as minutes from the engagement must be captured and provided as evidence.

Suitably qualified person

A suitably qualified person must be involved through-out the natural hazard risk assessment process. This should include oversight of the natural data and climate change projection identification and the risk assessment.

A suitably qualified person means a person with at least 3 years of experience in natural hazard and/or climate change risk assessments and relevant qualifications.

Risk Management Level

Level 1 – Adaptions for Direct Risks

Level 2 – Adaptions for Direct and Indirect Risks

Level 3 – Adaptions for Direct, Indirect risks consider the optimal scale and timing, and costs and benefits of addressing the natural hazard risk

The identification of direct, indirect risks (depending on the level targeted) and selection of adaption measures with subsequent reassessment of risk, must follow a recognised risk management standard and framework, such as ISO 31000. Country specific and client specific risk management guidelines, tools and requirements are likely to apply to the infrastructure project. Project team should consult with ISCA over the selected risk management framework.

Following treatment there must not be any residual extreme of high direct risks.

The selected natural hazard risks adaptations must be incorporated into final design with as built verification upon completion. Adaptation measures that require a management or governance response must be incorporated into operational management plans. Details on the person/department who will receive the relevant operational management documentation must be provided as evidence.

Direct natural hazard risks (Level 1)

Relates to the chance of an impact (attributable to natural hazards including climate change) on an infrastructure system or asset causing damage, extra maintenance or replacement costs, accelerated deterioration or disruption of services provided. An example is increased storm or flood damage to an asset.

Indirect risks (Level 2)

Relates to the chance of an impact on another system or asset, disrupting the direct supply of goods or services that your infrastructure system or asset critically relies on, thereby adversely impacting on your system or asset. It is important to consider the interdependence and cumulative impacts of different risks and their sources. Where the risks from natural hazards are likely to affect a large area or region the risk analysis should take into account how the region could respond and the capability of contingency plans and resources to respond to impacts at a wide scale. For example, power supply interruptions caused by excessive power demand during periods of extreme temperatures. Another example would be storm damage or disruption at a nearby port, which delays the delivery of urgently needed equipment so that the infrastructure has to be closed or its services curtailed. Indirect risks can also be known as ‘interdependent risks’
## Dependency types (Source: Rinaldi 2001)

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upstream dependencies</strong></td>
<td>The products or services provided to one infrastructure by another external infrastructure that are necessary to support its operations and functions.</td>
</tr>
<tr>
<td><strong>Internal dependencies</strong></td>
<td>The interactions among internal operations, functions, and missions of the infrastructure. Internal dependencies are the internal links among the assets constituting a critical infrastructure (e.g., an electric generating plant that depends on cooling water from its own onsite water well).</td>
</tr>
<tr>
<td><strong>Downstream dependencies</strong></td>
<td>The consequences to a critical infrastructure’s consumers or recipients from the degradation of the resources provided by a critical infrastructure.</td>
</tr>
</tbody>
</table>

## Classes of dependencies

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Infrastructure is physically dependent if the state of its operations is dependent on the material output(s) of another infrastructure through a functional and structural linkage between the inputs and outputs of two assets: a commodity (i.e., good or service) produced or modified by one infrastructure (an output) is required by another infrastructure for its operation (an input).</td>
</tr>
<tr>
<td>Cyber</td>
<td>Infrastructure has a cyber dependency if its state of operation depends on information and data transmitted through the information infrastructure via electronic or informational links. Outputs of the information infrastructure are inputs to the other infrastructure, and the commodity passed among the infrastructure assets is information.</td>
</tr>
<tr>
<td>Geographic</td>
<td>Infrastructure assets are geographically dependent if a local environmental event can create changes in the state of operations in all of them. A geographic dependency occurs when elements of infrastructure assets are in close spatial proximity (e.g., a joint utility right-of-way).</td>
</tr>
<tr>
<td>Logical</td>
<td>Infrastructure is logically dependent if its state of operation depends on the state of another infrastructure via a mechanism that is not a physical, cyber, or geographic connection. Logical dependency is attributable to human decisions and actions and is not the result of physical or cyber processes.</td>
</tr>
</tbody>
</table>

## Optimal Scale and Option Evaluation (Level 3)

The optimal scale and timing and costs and benefits of implementing each risk adaption option must be assessed before the preferred option is selected and implemented. Considering the optimal scale and timing in the risk assessment and treatment process recognises that some climate change risks are best not treated immediately. For example, the impact may not occur for many decades, a satisfactory treatment may not yet be available or greater certainty about climate change projections is required before a difficult decision can be made. It may also not be obvious how narrowly or extensively the treatment measure should be applied – in stages or all at once, and everywhere or only at the most vulnerable sites.

Treatment options are evaluated by considering environmental, social and economic aspects through the use of cost benefit analysis or multi-criteria analysis or other scored means must be undertaken to quantify treatment or treatment options. Impacts such as negative consequences of treatment options on other assets or systems must be included in the assessment. For example, the construction of a sea wall which displaces natural habitat may have a negative impact on aquatic species. Decision making related to treatment options should review each decision that needs to be made, the lifetimes and flexibility of these decisions, and the need to address near-
term issues while strategically creating options for the long-term future.

For treatments that are not implemented in design immediately, a treatment action plan must be prepared to formalise decision-making related to these treatments. This action plan should include details on the hazard impact, key vulnerabilities and risk, treatment option, timing of implementation and governance/responsibility. In principle commitment, should be made to address treatment and treatment options when appropriate as asset ownership changes. This should include a commitment embedded within management plans or a strategy document to ensure it has been formalised.

**Small Projects or where Materiality is Low**

For Level 1 undertake a qualitative review of identified natural hazard events and climate conditions relevant to the site or region and determine whether further investigation is required (e.g. does the site have a history of flooding, extreme temperatures, landslides, earthquakes etc.). Where evidence of previous impacts is found, undertake a high level review of climate change and natural hazard risks relevant to those particular impacts.

In addition, the suitably qualified person requirements in Level 1 are only required to review the finalised natural hazard report.

**Developing Countries and Complementary Risk Analysis Tools**

It is acknowledged that a number of disaster risk screening tools have been release or are currently being developed by institutions such as, The World Bank, Asian Development Bank (ADB), African Development Bank (AfDB), and Inter-American Development Bank Group (IDB) and other sector specific agencies and federations. All complementary tools will be suitable as long as they are sufficiently granular for application to specific risk management based adaption actions in the design, construction and operation of the infrastructure Project. Project teams are encouraged to discuss applicability with ISCA at the earliest opportunity.

Check online ISCA Guidance Repository for latest approved references.
The infrastructure industry is a large and intensive user of energy, water and materials. The consumption of energy today is strongly linked to the emission of greenhouse gases. Therefore, as with other major industries, the infrastructure industry faces considerable resource challenges, including:

- rising energy costs,
- water scarcity exacerbated by climate change,
- depletion of non-renewable resources such as fossil fuels, old growth forests and minerals and quarry products,
- adverse environmental impacts throughout the lifecycle of materials extraction, processing, use, recycling and disposal. Possible adverse impacts include ecological harm, pollution and waste generation.

The Using Resources categories focus on modelling and measuring resource consumption, identifying and implementing feasible opportunities to reduce consumption, and thereby achieving significant reductions in resource use across the infrastructure lifecycle.

The Using Resources theme contains the following categories:

- Energy and Carbon (Ene)
- Water (Wat)
- Materials (Mat)
BASE CASE APPROACH

Despite industry efforts, including the delivery of the IS rating scheme, there is only limited, industry baseline data for Energy and Carbon, Water and Materials impacts at the project/asset level to use for comparison and benchmark efficiency and performance. Consequently, the Using Resources categories adopt an approach of comparing actual and predicted performance for energy and carbon, materials and water against a self-proposed project/asset Base Case. This approach will also ultimately facilitate capture of good quality industry data over time which could support a shift to absolute performance benchmarks in later iterations of the rating scheme.

The Base Case approach is used to model and measure the performance of the project or asset (in terms of resource consumption or greenhouse gas emissions) and compare it to a business as usual base case footprint. Guidance for these concepts and the approach is provided here. ‘Footprint’ is a term that means the quantified impact of a certain issue across the infrastructure lifecycle. This term is used throughout these categories, except for the Materials category, where the term ‘impact’ is more correctly used.

Developing Countries

Developing countries have the option to use alternative credit criteria, without the use of Base Case. See details in the Energy, Water and Material Credits.

Base Case

A base case should be chosen that is a suitable, early design accepted by key stakeholders as being representative of the original concept for the infrastructure development. The design should be advanced enough to provide sufficient details, such as a bill of quantities, from which footprints can be calculated and, ideally where business-as-usual (BAU) technologies can be identified. This might be a concept design or a reference design which is used for tendering purposes.

The Base Case Design needs to be formally adopted by the key stakeholders in the project or asset and documentation of this must be provided. The same Base Case must be used consistently across the following credits in the Energy & Carbon, Water and Materials categories:

- **Ene-1** (Level 2 and 3 only)
- **Wat-1** (Level 2 and 3 only)
- **Wat-2** (Level 1 and 2 only)
- **Mat-1** (Level 2 and 3 only).

The establishment of a suitable Base Case should be discussed at the Kick-off Workshop. The Assessor must submit the Base Case Proposal Form to the Case Manager following the Kick-off Workshop and as early as possible in the Assessment phase. The form includes details on the name of the design, the design’s purpose and function and the design life.

The form also includes section on ‘base case qualities’. These include:

- **Applies Business As Usual Technologies** - BAU technologies should be recent, used for similar purposes and in similar locations. Assumptions should be stated.

The design selected may or may not apply business as usual technologies. Where a later design is chosen, which has technologies/initiatives that do not represent business as usual, the base case and footprints may need to be adjusted. See the ‘Base Case Adjustment’ section below.

- **Transparency** - This can be demonstrated by showing that the base case is accepted by key stakeholders and/or that it was developed independently of those delivering the project/asset.

- **Matching Scope** - Show that the scope of the Base Case matches the scope of the IS rating. Explain any boundary differences, their significance and how they will be addressed.

If the scope of the base case does not completely match the actual case, the base case footprints will need to be adjusted.

- **Accuracy and Detail** - Describe how the Base Case provides suitable detail to allow robust estimation of appropriate base case footprints.
including how any gaps will be addressed. Explain how the Base Case information covers the full infrastructure lifecycle (construction and operation).

Alternatives - Describe the alternative designs that were considered for adoption as the Base Case and justify why these were not chosen (relating back to the Base Case qualities above).

The form also requires:

- identification of which credits are to use the base case and
- descriptions of how the Base Case Footprint(s) will be calculated from the Base Case including any BAU assumptions and use of any base case adjustment (see below).

The Base Case needs to be verified through ISCA early on in the assessment process to ensure the approach is sound, to ensure the correct data is collected for the assessment and to prevent unnecessary time being spent analysing footprints of inappropriate designs. Once the Base Case has been verified, this Base Case must be used for all relevant credits in the Assessment.

Base Case Footprints

The base case footprints are the estimated environmental impact of the base case using BAU technologies, over the entire infrastructure lifecycle (construction and operations phases combined), in relation to the particular impact being measured. For example, the base case carbon footprint for the ‘Design’ rating is the estimated total GHG emissions for the construction and operations phases based on the base case (design) chosen.

Base Case Adjustment

It is common that the decision of a suitable base case is largely pragmatic, based on what suitable design information is available. Very early designs may be too high level to allow footprints to be estimated, while later designs may already incorporate beyond BAU sustainability initiatives which should rightfully be recognised in any measurement of project performance. To address the situation where a later design is chosen which incorporates beyond BAU initiatives, a process of ‘extracting’ these initiatives from the selected design can be applied to establish a base case.

This process is outlined as follows:

1. Select a suitable design upon which to base the base case as per the processes described above.
2. Identify whether there are key sustainability initiatives that form part of the proposed design that are clearly beyond BAU and should be recognised as part of the project’s performance measurement through the rating tool.
3. Estimate the (relevant environmental) footprint(s) for the chosen design.
4. Replace the key sustainability initiatives with a BAU alternative in the base case footprint(s).
5. Provide the explanation for this process and the sustainability initiatives in the base case proposal form as per above, including justification that the initiatives are beyond BAU.
6. Provide summary and details of the footprint and initiative calculations in the credit summary form for the relevant credit in the Assessment submission.

Actual Case

For the Design rating, the actual case is the design at the end of the design phase. For the As-Built rating, the actual case is the as-built design at the end of construction.

Actual Case Footprints

For the Design rating, the actual case footprint is the estimated environmental impact of the design, over the entire infrastructure lifecycle (construction and operations phases), in relation to the particular impact being measured. For example, the actual carbon footprint for the ‘Design’ rating is the estimated total GHG emissions for the construction and operations phases based on the actual case.

For the ‘As Built’ rating, the actual case footprint is the estimated environmental impact of the as-
built design, over the entire infrastructure lifecycle (construction and operations phases), in relation to the particular impact being measured. This will consist of the measured construction footprint plus the modelled operation footprint. For example, the actual case carbon footprint for the ‘As-Built’ rating is the measured GHG emissions for the construction phase plus the modelled GHG emissions for the operations phase based on the planned (future) operation of the as-built infrastructure.

A summary of the various cases and footprints is shown in Table 1.

Reductions
Each of the Ene-1, Wat-1 and Mat-1 credits and are ‘scaled’. No reduction between base case and actual case is required to be demonstrated to achieve Level 1 (only monitoring and modelling). In fact, no base case is required at all. To achieve higher than Level 1, a reduction between base case and actual case footprints is required. For every unit of performance improvement up to Level 3, fractions of Levels may be achieved on a sliding scale. This sliding scale approach provides encouragement to pursue every reduction opportunity possible.

The difference between the base and actual case footprints should be explained in the credit summary form by describing the key changes and their impacts in terms of reductions or increases in footprint. It is recommended that this be supported by using a waterfall chart or similar.

See each of the relevant credits for details.

Table 1 Summary of Cases and Footprints Used in the ‘Using Resources’ Categories

<table>
<thead>
<tr>
<th>Rating Type</th>
<th>Base Case</th>
<th>Base Case Footprint</th>
<th>Actual Case</th>
<th>Actual Footprint</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Concept design*</td>
<td>Modelled construction and operation performance</td>
<td>Detailed design</td>
<td>Modelled construction and operation performance</td>
<td></td>
</tr>
<tr>
<td>As Built</td>
<td></td>
<td></td>
<td>As-built design and its intended operation</td>
<td>Measured construction and modelled operation performance</td>
<td></td>
</tr>
</tbody>
</table>

*Or other suitable, early design accepted by key stakeholders as being representative of the original concept for the infrastructure development and using business-as-usual (BAU) technologies.
ENERGY & CARBON

Global energy use continues to rise as economies grow. The use of fossil fuels (coal, natural gas and oil) to generate energy creates greenhouse gas (GHG) emissions which causes climate change. Climate change will adversely impact the systems that support our way of life such as ecosystems and climatic systems.

In 2017, 146 Parties have ratified the Paris Agreement, a global agreement under the United Nations Framework Convention on Climate Change (UNFCCC) to limit global temperature rise to well below 2°C. This Agreement was the first of its kind and for the first time brings all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries to do so (UNFCCC).

To achieve these targets, all industries and individuals will need to reduce their energy consumption and GHG emissions.

About this Category

This category prioritises the avoidance of GHGs and minimising energy use through design, efficient operation and the use of renewables. It also recognises the use of carbon offsets.

The intent of this category is to prioritise reduction in energy use and GHG emissions before carbon offsetting. The credit structure therefore aligns with the following hierarchy:

1. Reducing energy use and GHG emissions through construction and operation (i.e. designing out the need for activities that use energy or generate GHG emissions in the first place) (Ene-1)
2. Undertaking any necessary activities as efficiently as possible (i.e. maximising energy efficiency). (Ene-1)
3. Using renewable energy to replace non-renewable sources. (Ene-2)
4. Carbon offsetting (Ene-3)

The following three credits comprise the Energy and Carbon category:

Ene-1 Energy and greenhouse gas monitoring and reduction
Ene-2 Use of renewable energy
Ene-3 Carbon offsetting

Related categories

This category rewards climate change mitigation, whereas the Climate category rewards climate adaptation.

Embodied energy and GHG emissions associated with materials (such as the transportation of materials) are considered separately in the Materials category.

The Ecology category considers other benefits of GHG offsets such as forest sinks.
DEVELOPED COUNTRIES

Ene-1  Energy and greenhouse gas monitoring and reduction

Aim
To reward monitoring and minimising of energy use and greenhouse gas (GHG) emissions across the infrastructure lifecycle.

Criteria

<table>
<thead>
<tr>
<th>Benchmark – Developed Countries</th>
<th>Level 1</th>
<th>Level 1 to 3 on sliding scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring and modelling of energy use and GHG emissions, and actions taken to reduce them, is undertaken, covering at least Scope 1, Scope 2 and land clearing across the infrastructure lifecycle.</td>
<td>Monitoring and modelling demonstrates a reduction in GHG emissions compared to a base case footprint. For every reduction up to 30% for Level 3, fractions of Levels may be achieved on a sliding scale.</td>
<td></td>
</tr>
<tr>
<td>AND</td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td>Energy and GHG emissions reduction opportunities are fully investigated for whole of life and a minimum of 3 reduction initiatives are identified for construction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All feasible opportunities in operation are implemented</td>
<td>The evidence for Level 1.</td>
<td></td>
</tr>
<tr>
<td>Evidence</td>
<td>AND</td>
<td></td>
</tr>
<tr>
<td>Energy and carbon footprint report. Opportunities analysis report. Design and As Built reports and / or drawings.</td>
<td>Report comparing actual and modelled GHG emissions to a base case footprint.</td>
<td></td>
</tr>
</tbody>
</table>

Additional Guidance

Embodied energy and emissions in materials must not be included as they are considered in the Materials Category.

Use of renewable technology and carbon offsets are not rewarded for the purposes of this credit due to offsetting often detracting from the credit aim to reduce energy use. Renewable technology is awarded in Ene-2 - Developed Countries and offsetting is rewarded in Ene-3 - Developed Countries.

Monitoring and Modelling
To achieve Level 1, energy use and GHG emissions must be monitored and modelled. The term modelling here refers to reasonable estimates, calculations or predictions. For a Design rating, this should be based on the detailed design. For the As-Built rating, monitoring must be undertaken during construction and modelling of energy use and GHG emissions must be undertaken for the operation phase based on the as-built infrastructure to give a total footprint across the infrastructure lifecycle. No base case footprint needs to be established to achieve Level 1.

Monitoring and modelling of major end use categories should be undertaken. A breakdown may be across different construction activities (e.g. tunnelling, excavation, transport, piling etc.), fuel type (diesel, petrol, LPG), equipment (trucks, excavators, generators, cranes etc.) and zones (different parts of the project or infrastructure e.g. road, shared path, bridge etc.). This level of disaggregation is encouraged
as it will eventually allow for benchmarking across similar types of infrastructure and for sub-components of infrastructure (for example, kg CO2-e/km of road built). Activities considered should include at least:

- Stationary energy use.
- Mobile energy use.
- Fugitive emissions from pipelines, equipment and industrial processes.
- Wastewater treatment.
- Land use change / land clearing.

To allow for industry benchmarking, the footprint should include the following summary figures (for each of the activities, where applicable to the phase):

- Total energy use (expressed in MJ) and total GHG emissions (expressed in tonnes CO2-e) during delivery (design and construction) of the infrastructure.
- Monthly energy use (in MJ/month) and monthly GHG emissions (in tonnes CO2-e/month) during delivery of the infrastructure. These figures should be calculated over the entire delivery (design and construction) period.
- Annual operational energy use (in MJ/year) and annual operational GHG emissions (in tonnes CO2-e/year) over the forecast useful life of the asset. Total energy use (expressed in MJ) and total GHG emissions (expressed in tonnes CO2-e) over the full infrastructure lifecycle.

All energy and GHG footprints should comply with the International Standard ISO 14064.1. “Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.” Other local and international Standard and Guidelines might be acceptable. The suitability of these will need to be approved by ISCA prior to use.

Embodied energy and emissions in materials must not be included as they are considered in the Materials Category.

**Footprint Scope**

The estimate of energy use and GHG emissions must cover at least Scope 1 and Scope 2 emissions, plus emissions from land clearing or land use change, but do not need to include Scope 3 emissions. Scope 1, 2 and 3 emissions are defined as follows:

- Scope 1 emissions are the emissions that are released to the atmosphere as a direct result of the activities within the project boundary and where the project has direct control of (e.g. emissions of subcontractor vehicles)
- Scope 2 emissions are indirect emissions from purchased electricity
- Scope 3 emissions are other indirect emissions from activities associated with the project but not controlled by the project.

Significant sources of Scope 3 energy use and emissions over the asset lifecycle may include:

- Energy use or GHG emissions by users of the infrastructure (e.g. vehicles travelling on a motorway).
- Transport-related activities.
- Transportation of purchased or rented facilities or equipment where they are not included in the materials footprint (i.e. transportation and removal of temporary site office.)
- Transportation of purchased fuels used by the project.
- Employee business travel.
- Employees commuting to and from work.
- Transportation of waste.
- Extraction, production, and transportation of fuels consumed in the generation of electricity (either purchased or generated by the reporting company).
- Emissions derived from waste disposal, including off-site waste generated in construction and operations; waste generated in the production of purchased materials and fuels; and other waste.
- Emissions derived from disposal of waste generated in the production of purchased materials and fuels.
• Decommissioning of the asset at the end of its life.
• Secondary effects of asset delivery of operation, such as induced traffic growth, avoided energy use or GHG emissions for public transport projects.
• Exports of fossil fuels associated with port construction.

Note that embodied energy and emissions, must not be included, as they are considered in the Materials Category.

Any source of energy use or GHG emissions that is likely to account for more than 5% of the aggregate footprint of Scope 1 and 2 and land clearing is considered significant and must be included. Assessors may choose to broaden the scope of the footprint monitored beyond Scope 1 and 2 and land clearing to include Scope 3 emissions. Where assessors have been successful in reducing energy use and GHG emissions from Scope 3 sources, there may be advantages in such broadening and including Scope 3 sources in the emissions reduction calculations in order to achieve the credit benchmarks.

Manage/Review/Audit

The monitoring and modelling of energy and GHG emissions must be either managed by, reviewed by, or audited by a suitably qualified person.

A suitably qualified person for the purposes of this credit is someone who has a formal qualification and a minimum of five years' experience in energy or GHG management.

Small Projects

The manage/review/audit requirement does not apply.

Reductions

Energy and GHG emissions reduction opportunities must be fully investigated. Fully investigated means assessment of opportunities using a decision-making framework which considers the forecast useful life of the asset. This decision making framework must be applied to all energy reduction opportunities.

A minimum of 3 reduction initiatives for construction must be identified and assessed unless a limited scope of works can be demonstrated.

For Level 3, points are awarded on a scale. As noted above, no reduction is required to be demonstrated to achieve Level 1. Where a reduction compared to a base case footprint is achieved, for every unit of reduction up to 30% for Level 3, fractions of Levels may be achieved on a sliding scale. For example, a 10% reduction would achieve Level $1 + (10\% / 30\%) \times (3 - 1) = Level 1.67$. This sliding scale approach provides encouragement to pursue every reduction opportunity possible. Reductions beyond 30% may be awarded innovation points.

Opportunity Analysis

Projects should undertake an analysis of opportunities to reduce energy use and GHG emissions across the infrastructure lifecycle. The opportunity analysis should cover at least Scope 1 and 2 energy use and GHG emissions and land clearing or land use change emissions.

Scope 3 energy use and GHG emissions may also be identified and analysed as noted above.

Guidance on opportunity analysis is available in the International Standard ISO 50001 “Energy Management”. ISO 50001 supports organizations in all sectors to use energy more efficiently, through the development of an energy management system. A European Energy Efficiency Platform has also been set by the European Commission to provide a one stop shop for energy efficiency data and knowledge (see ISCA’s Guidance Repository).

Peak Electricity Demand

While not a credit requirement, consideration should also be given to the impact of the construction and operation of the infrastructure on peak electricity demand, where the infrastructure is grid connected. Where an infrastructure asset does not draw heavily on the electricity grid at peak times, the impact on peak electricity demand will be minor and there will be few opportunities to reduce peak demand. However, some infrastructure assets will draw heavily on the electricity grid and more
significant opportunities for demand reduction may exist.

Implementation

It is recommended that all feasible opportunities with a financial payback period of four years or less are implemented. However, for construction based opportunities, if the construction period is less than four years, then the payback period should be the construction duration rather than four years.

Energy and Carbon Management Plan

It may be useful to incorporate identified opportunities into management plans. These would document:

- The process used to identify opportunities to reduce energy use and GHG emissions,
- A list of all the opportunities identified (with explanations),
- The process used to analyse and evaluate opportunities,
- Commitments to implement particular opportunities during delivery and operation, and
- Explanations of why other identified opportunities were not taken up.

GHG emissions reduction initiatives could also be incorporated into a sustainability opportunities (or initiatives) register, as discussed in Man-2 Risk and Opportunity Management.

Alternative criteria

For regions where the grid power has an inherently low carbon intensity, maximum points for Level 3 can be achieved for reduction of 20%, as per the New Zealand IS Technical Manual. The rationale is that it is harder for these regions to achieve a high reduction in GHG emissions, so the change in benchmark aims to reward and encourage energy efficiency. Project are invited to discuss with ISCA if they wish to use this alternative criterion.

Check online ISCA Guidance Repository for latest approved references.
DEVELOPING COUNTRIES

Ene-1 Energy and greenhouse gas monitoring and reduction

Aim

To reward monitoring and minimising of energy use and greenhouse gas (GHG) emissions across the infrastructure lifecycle.

Criteria

<table>
<thead>
<tr>
<th>Level 1 to 3 on sliding scale</th>
<th>Benchmark - Developing Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy and GHG emissions reduction opportunities are fully investigated for the whole of life of the project. AND The energy metering and monitoring strategy is implemented. AND One construction and one operational energy reduction initiatives as shown in Table 1 of this credit has been identified and implemented AND An energy security assessment is undertaken.</td>
<td>The requirements for Level 1 are achieved. AND Reduction initiatives as shown in Table 1 of this credit have been identified and implemented. For every energy reduction initiative, up to 8 initiatives for Level 3, fractions of Levels may be achieved on a sliding scale.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Evidence</td>
</tr>
<tr>
<td>Energy and GHG emissions reduction opportunities analysis. Energy metering and monitoring strategy. Energy security assessment.</td>
<td>The evidence for Level 1. Design and as built documentation showing the incorporation of the energy and GHG reduction initiatives.</td>
</tr>
</tbody>
</table>

Additional Guidance

Developing countries have the option to use this credit or credit Ene-1 for Developed countries.

Credit scope

An analysis of opportunities should be undertaken to reduce energy use and GHG emissions across the infrastructure lifecycle. The opportunity analysis must cover Scope 1, 2 and 3 emissions, plus emissions from land clearing or land use change. Scope 1, 2 and 3 emissions are defined as follows:

- Scope 1 emissions are the emissions that are released to the atmosphere as a direct result of the activities within the project boundary and where the project has direct control of (e.g. emissions of subcontractor vehicles)
- Scope 2 emissions are indirect emissions from purchased electricity
- Scope 3 emissions are other indirect emissions from activities not controlled by the project.

The opportunities analysis must include review of the initiatives listed in Table 1 as a minimum. Guidance on opportunity analysis is available in the International Standard ISO 50001 “Energy Management”. ISO 50001 supports organizations in all sectors to use energy more efficiently, through the development of an energy management system. A European
Energy Efficiency Platform has also been set by the European Commission to provide a one stop shop for energy efficiency data and knowledge (see ISCA’s Guidance Repository).

**Metering and Monitoring**

For Level 1, an energy metering and monitoring strategy must be developed. Metering and monitoring of all major uses should be undertaken.

The metering required and types of monitoring will vary across infrastructure types and phases.

**Energy Security Assessment**

To achieve Level 1, projects must complete an energy security assessment of potentially affected communities. The assessment will review and describe potential risks to energy security (e.g. power supply) of these communities. For more information see Developing Countries Guidance in Man-7. To achieve Level 1, only an assessment is required. Should the risk assessment identify a potential impact to the local community, there must be an appropriate remedy for this risk implemented. Points can be achieved in Levels >1 to 3 if measures towards energy security are implemented.

**Peak Electricity Demand**

While not a credit requirement, consideration should also be given to the impact of the construction and operation of the infrastructure on peak electricity demand, where the infrastructure is grid connected. Where an infrastructure asset does not draw heavily on the electricity grid at peak times, the impact on peak electricity demand will be minor and there will be few opportunities to reduce peak demand. However, some infrastructure assets will draw heavily on the electricity grid and more significant opportunities for demand reduction may exist.

**Reduction Initiatives**

This is a scaled credit. One construction and one operational reduction initiatives must be implemented to achieve Level 1. Above level 1, points are awarded based on the number of initiatives implemented by the project team.

For each initiative, a sliding scale approach applies providing encouragement to pursue every opportunity possible, up to 8 initiatives where maximum points will be awarded (Level 3). The implementation of more than 8 initiatives may be awarded innovation points.

The following formula can be used to work out the points achieved:

\[ \text{Points} = 1 + 0.25 \times (\text{number of initiatives}) \]

Specific initiatives must be identified by the project team based on the relevant risks and opportunities. For points to be awarded initiatives must make a material impact on the overall energy use of the asset and this must be demonstrated.

For small projects, a risk assessment is not required. Material reduction assessment can be implemented based on qualitative identification.

Suggested optional initiatives have been listed for reference in Table 1.

**Implementation**

It is recommended that all feasible opportunities with a financial payback period of four years or less are implemented. However, for construction based opportunities, if the construction period is less than four years, then the payback period should be the construction duration rather than four years.

**Energy and Carbon Management Plan**

It may be useful to incorporate identified opportunities into management plans. These would document:

- The process used to identify opportunities to reduce energy use and GHG emissions,
- A list of all the opportunities identified (with explanations),
- The process used to analyse and evaluate opportunities,
- Commitments to implement particular opportunities during delivery and operation, and
- Explanations of why other identified opportunities were not taken up.

GHG reduction initiatives could also be incorporated into a sustainability opportunities
(or initiatives) register, as discussed in Man-2 Risk and Opportunity Management.

Check online ISCA Guidance Repository for latest approved references.

Table 1 Energy saving opportunities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Energy saving opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Methods</strong></td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>Reduce total construction time, e.g. by using pre-fabricated modules for construction</td>
</tr>
<tr>
<td>C2</td>
<td>Minimise the use of high energy consuming machinery</td>
</tr>
<tr>
<td>C3</td>
<td>Use alternative sources to fuel vehicles, e.g. use of electric vehicles for at least 30% of the fleet</td>
</tr>
<tr>
<td>C4</td>
<td>Use automated controls on all lighting on temporary works (e.g. motion sensors in site offices)</td>
</tr>
<tr>
<td>C5</td>
<td>All site offices are naturally ventilated</td>
</tr>
<tr>
<td>C6</td>
<td>Energy security of potentially affected communities is not compromised by the construction of the project.</td>
</tr>
<tr>
<td><strong>Operation</strong></td>
<td></td>
</tr>
<tr>
<td>O1</td>
<td>The buildings in the project are naturally ventilated</td>
</tr>
<tr>
<td>O2</td>
<td>Use of mechanical equipment for heating and cooling with the following COP’s:</td>
</tr>
<tr>
<td></td>
<td>- Water cooled chiller: 4.2 (Wr/Winput power) for full load operation</td>
</tr>
<tr>
<td></td>
<td>- Air cooled or evaporatively cooled chiller: 2.5 (Wr/Winput power) for full load operation</td>
</tr>
<tr>
<td></td>
<td>- Packaged air – conditioning – cooling mode: 2.70 (Wr/Winput power)</td>
</tr>
<tr>
<td></td>
<td>- Packaged heat pumps – cooling mode: 2.60 (Wr/Winput power)</td>
</tr>
<tr>
<td>O3</td>
<td>Thermal efficiency of gas and oil water heaters: 85%</td>
</tr>
<tr>
<td>O4</td>
<td>Use LED lights throughout</td>
</tr>
<tr>
<td>O5</td>
<td>Use automated controls on all lighting (e.g. photoelectric cells for daylight harvesting, time controls for lights in plant rooms etc.)</td>
</tr>
<tr>
<td>O6</td>
<td>Energy security of potentially affected communities is not compromised by the operation of the project.</td>
</tr>
</tbody>
</table>
Ene-2 Use of Renewable Energy

Aim
To reward investigation and use of renewable energy.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 1 to 3 on sliding scale</th>
</tr>
</thead>
</table>
| Feasible opportunities for the use of renewable energy options are fully investigated and implemented. | The requirements for Level 1 are achieved.  
AND  
For energy demands, substitutions sourced from renewable resources up to 100% of the balance of the projected energy consumption may be achieved on a sliding scale. |
| Opportunity assessment     | The evidence for Level 1.  
AND  
Energy modelling reports  
Design and As Built drawings  
Agreements/contracts  
Proof of purchase of renewable technology |
| Design report              |                                                                         |                                                                                               |
| Design and As Built drawings |                                                                         |                                                                                               |
| Management plans           |                                                                         |                                                                                               |

Renewable energy does not necessarily contribute to a reduction in energy usage, however, it is encouraged as it improves energy security and reduces GHG emissions. In addition, on-site renewable electricity generation can also reduce peak electricity demand.

For the purpose of this credit and in line with EU and UN definitions, renewable energy is defined to be energy which comes from natural resources that can be constantly replenished. Renewable energy technologies include electricity, gas and heat generated from solar, wind, ocean, hydropower, biomass (waste to energy, landfill gas), geothermal resources, and/or hydrogen derived from renewable resources. It also includes renewable energy purchased through an energy retailer or renewable energy project developer. If there is a national mandatory, Renewable Energy Target or equivalent, this credit will only reward the renewable energy that is in addition to the mandatory national requirements.

Table 2 below has been adapted from the Australian Helping Business- Pathways to Purchase Renewable Energy (WWF, 2016) and outlines renewable energy options rewarded under this credit and can be applied internationally.
Table 2: Renewable energy options that rewarded under this credit. Adapted from *Helping Business-Pathways to Purchase Renewable Energy*, WWF 2016

<table>
<thead>
<tr>
<th>Option</th>
<th>Details</th>
<th>Grid/Local</th>
<th>Counterparty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Install on-site renewable technology</td>
<td>Any onsite renewable energy technology such as a photovoltaic array or biogas from a waste water treatment facility or landfill.</td>
<td>Local</td>
<td>Project/ Retailer</td>
</tr>
<tr>
<td>GreenPower</td>
<td>Retailer purchases renewable energy on your behalf.</td>
<td>Grid</td>
<td>Retailer</td>
</tr>
<tr>
<td>Power Purchase Agreement (PPA) Offtake agreement</td>
<td>Purchase some or all generation from utility-scale project.</td>
<td>Grid</td>
<td>Project Developer</td>
</tr>
<tr>
<td>Connect local projects with offsite demand</td>
<td>Import renewable energy from local renewable energy projects</td>
<td>Local distribution</td>
<td>Market participant</td>
</tr>
</tbody>
</table>
Level 1
For Level 1 all feasible opportunities for the use of renewable energy must be fully investigated and implemented in design and construction.

Opportunities should also include options for construction and operation. A minimum of 3 renewable energy options must be investigated. Options could include three separate onsite renewable technology options or a combination of options described in Table 2.

Justification must be provided for the options that are selected for implementation and why other options are not selected. This assessment should be completed with the opportunities assessment completed as part of Ene-1.

Implementation means that design related initiatives are documented in final design reports and as built drawings and construction related initiatives have occurred during the construction phase.

Level 1>1 to 3
Modelling must be undertaken to show the percentage of energy demand that will be substituted by renewable energy. If modelling was undertaken in Ene-1, it can be used if it outlines renewable energy substitution. Only Scope 1 and 2 emissions as defined in Ene-1 are considered in this credit. Renewable energy options rewarded under this credit are outlined in Table 2. Modelling must include:

- Total energy use (expressed in MJ) and total GHG emissions (expressed in tonnes CO2-e) during delivery (design and construction) of the infrastructure. These figures should be calculated over the entire delivery (design and construction) period.
- Monthly energy use (in MJ/month) and monthly GHG emissions (in tonnes CO2-e/month) during delivery of the infrastructure. These figures should be calculated over the entire delivery (design and construction) period.
- Annual operational energy use (in MJ/year) and annual operational GHG emissions (in tonnes CO2-e/year) over the forecast useful life of the asset.

- Total energy use (expressed in MJ) and total GHG emissions (expressed in tonnes CO2-e) over the full infrastructure lifecycle.

Developing countries
As no detailed energy modelling is required by developing countries for Ene-1, in order to address the requirements of this credit, developing countries also have the option to use the total predicted energy use as estimated by the services engineers for the services design, instead of doing detailed modelling.

Beyond Level 1, for every unit of substitution up to 100%, fractions of Levels may be achieved on a sliding scale. For example, a 25% substitution of renewable energy would achieve Level 1.5 (1 + (25 /100) x (3–1)). This sliding scale approach provides encouragement to pursue every substitution opportunity possible. Note that total energy use includes electricity and fuels (i.e. Scope 1 and 2).

For electricity sources, the percentage of renewable substitution claimed can only be associated with the electricity in the grid which is non-renewable. For example, if a project is in a region which has 40% renewables within the grid, the percentage substitution claimed under this credit would be based on any renewable replacement of the 60% non-renewable portion. If a project used 100MWh over its life, then 60MWh (60%) would be available for substitution under this credit. To achieve level 1.5, a 25% reduction would be required. 25% of 60MWh is 15MWh. Therefore, 15MWh of renewable energy would achieve a 25% reduction and be awarded level 1.5. This credit rewards renewable energy only and offsets from renewable energy projects can be rewarded under Ene-3.

Additional Information
Hydropower
According to EU and UN definitions, hydropower is considered to be renewable resource (see ISCA Guidance Repository). However, in some jurisdictions hydropower is
not considered a renewable form of resource, e.g. large scale hydropower in California. In this instance the definition of the local jurisdiction should take precedence for the purposes of this credit. E.g. Large hydro is not to be counted towards this credit.

**Biofuels**

There are a number of opportunities to utilise biofuels in the construction and operations of infrastructure projects. In construction, biofuels may be used for plant and machinery and diesel generators used for generating electricity where grid connection is impractical.

Biofuel is infrequently and inconsistently used in infrastructure due to fluctuations in available supply, coupled with perceived concerns around the warranty of plant and equipment. Many of these concerns can be addressed through early planning and tender for biofuels, agreeing or even mandating their use with suppliers before commencement of construction.

Check online ISCA Guidance Repository for latest approved references.
Ene-3 Carbon Offsetting

Aim
To offset residual energy and carbon emissions from construction and operation.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 0 - 3</td>
<td>The residual emissions from credits Ene-1 and Ene-2 are offset, up to 100%. Fractions of Levels may be achieved on a sliding scale.</td>
</tr>
<tr>
<td></td>
<td>Letter of commitment or certificate of purchase/currency/purchase agreement/ carbon offset purchase agreement</td>
</tr>
<tr>
<td></td>
<td>Memo confirming cancellation of offsets and percentage of total carbon emissions offset</td>
</tr>
<tr>
<td></td>
<td>Energy model or other energy estimation calculations</td>
</tr>
</tbody>
</table>

The intent of this credit is to reward a commitment to offsetting of monitored residual emissions.

**Level 0-3**
For every percentage point of committed offsets 100%, fractions of Levels may be achieved on a sliding scale. The percentage offset claimed under this credit can only be associated with the residual emissions. Residual emissions are the amount of emissions remaining following the implementation of energy reduction initiatives (Ene-1) and after any reductions made through the use of renewable energy (Ene-2). For example, if a project produces 10,000 tCO₂-e over its lifecycle and 1,200 tCO₂-e were reduced through energy efficiencies with an extra 2,300 tCO₂-e reduced through onsite renewables, then the residual emissions would be 6,500 tCO₂-e. To achieve Level 3 the full 6,500 tCO₂-e would need to be offset, however fractions of levels may be achieved. To achieve level 1.5, a commitment to offset 25% of the residual emissions would need to be made ((25 /100) x 3). 25% of 6,500 tCO₂-e is 1,625 tCO₂-e, therefore a commitment to offset 1,625 tCO₂-e would be awarded level 1.5.

. Only Scope 1 and 2 emissions as defined in Ene-1 are considered in this credit.

Recognising that offsetting would be confirmed until after practical completion, a commitment to carbon offsetting must be provided for Design stage. This may take the form of a forward commitment letter or contract outlining the type of offset, the quantity to be cancelled and the method including the project where the offsets have originated from. This commitment must be against the modelled carbon footprint for construction and operations and state the percentage of total carbon emissions to be offset.

There are several carbon offset standards which can be applied internationally. These include (see ISCA Guidance Repository):

- The Climate, Community and Biodiversity Alliance
- CarbonFix Standard
- Plan Vivo Standards
- Verified Carbon Standard

Check online ISCA Guidance Repository for latest approved references.
WATER

Fresh water is becoming increasingly scarce and excessive consumption threatens ecosystem function. By 2025, half of the world’s population will be living in water-stressed areas (World Health Organisation, 2016). Conserving water is becoming increasingly important as large parts of the world face a widening gap between an ever diminishing supply due to climate change and an ever increasing demand due to population growth. The environmental and economic cost of water use will become an increasingly significant consideration for all infrastructure assets. At the same time, water use can generate wastewater or runoff. Managing runoff and wastewater to prevent pollution incurs environmental and economic costs.

In regard to water, the aim of all infrastructure assets at each stage of their life cycle should be first to avoid or reduce water consumption per service output, and then to substitute potable water with non-potable or recycled water sources e.g. from stormwater, wastewater, groundwater and recycled water networks.

Reducing water consumption in infrastructure can help:

- restore water-stressed ecosystems,
- provide healthy, safe and reliable water supplies,
- encourage reuse and recycling of wastewater where cost effective,
- aviate water security risk that may lead to regional conflicts and tensions
- facilitate water trading between and within the urban and rural sectors and
- encourage innovation in water supply sourcing, treatment, storage and discharge.

Precious water resources need to be conserved through best practice water management. In the water sector, this has typically been approached through demand management.

Demand management (DM) takes what is called an ‘end use’ focus. In other words, it focuses on what the water is used for (the end use) and aims to reduce the volume required whilst maintaining the service. DM programs in the urban water sector have led to huge water savings for utilities and for residential and industrial customers. Looking at water use from an end use perspective also allows a water planner to identify what quality of water is required. Non-potable water supplies can then be identified (e.g. rainwater, industrial or residential wastewater, stormwater) and treated to the appropriate quality.

Water is used in infrastructure projects and assets to achieve a wide array of outcomes, such as dust suppression during construction; public health protection for workers (e.g., ablution blocks); or vehicle or equipment washing during operation. There is also a special subset of infrastructure projects/assets whose purpose is to provide water, wastewater, or stormwater services. For those projects/assets, water has much more significance.

Monitoring how much water is consumed by different water demands (i.e. end uses) is not standard practice. Little general data is available, making benchmarking difficult. So, one focus of this category is to collect water use data and make it available to the industry.

The intent of this category is to facilitate the development of infrastructure that:

- minimises the volume of water used per service output through demand management,
- encourages the effective substitution of potable water with locally appropriate alternative sources, and
- minimises the ecosystem impacts of local water extraction/harvesting.

Water use in the design, construction and operation of the various types of infrastructure covered by the IS rating tool varies considerably, by activity (end-use), volume, quality, and impact. The key challenge for this rating tool is to overcome these contextual constraints whilst enabling comparability among projects/assets when little data is available. Accordingly, credits for this category apply the basic principles embedded in the waste
Sustainable water use is based on three basic principles which are relevant to every stage in the life of an infrastructure asset. The first is simply to minimise the volume of water used. The second is to be sensible about what type of water is used - that is, to minimise the impacts associated with the supply. Achieving these outcomes requires a good understanding of how, where and why water is used, so the third principle is to measure water use. The credits for this category are based on these three principles.

The IFC Environmental, Health and Safety Guidelines for Water and Sanitation provide good international industry practice and are designed to be consulted together with Country specific guidelines or standards relating to water quality, conservation and replacing potable water.

Similarly, project/asset-specific guidelines should be consulted.

Compaction and sub-grade stabilisation is a major water use on many construction projects and for road maintenance. It is included in the targets for reducing water use to encourage innovation because it is such a significant water use.

The following two credits apply to the Water category:

Wat-1 Water use monitoring and reduction
Wat-2 Replace potable water

This Water category focuses on water efficiency and water reuse, rather than on the downstream environmental impacts of water use which is dealt with in the ‘Discharges to air, water and land’ category.

Management of aquatic ecosystems is dealt with in the Ecology category.
DEVELOPED COUNTRIES

Wat-1 Water use monitoring and reduction

Aim

To reward monitoring and minimising water use as much as possible across the infrastructure lifecycle.

Criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level &gt;1 to 3 on sliding scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metering, monitoring and modelling of water use is undertaken.</td>
<td>The requirements for Level 1 are achieved.</td>
</tr>
<tr>
<td>AND</td>
<td>AND</td>
</tr>
<tr>
<td>Water reduction opportunities are fully investigated for whole of life and a minimum of 3 reduction initiatives are identified for construction.</td>
<td>Monitoring and modelling demonstrates a reduction in water use compared to a base case footprint.</td>
</tr>
<tr>
<td>AND</td>
<td>For every reduction up to 20% for Level 3, fractions of Levels may be achieved on a sliding scale.</td>
</tr>
<tr>
<td>All feasible opportunities are implemented</td>
<td></td>
</tr>
</tbody>
</table>

Benchmark

- Metering, monitoring and modelling of major end use categories should be undertaken. The types of monitoring will vary across infrastructure types and phases.

Evidence

- Report on actual and modelled water use across the infrastructure lifecycle.
- Water reduction opportunities analysis.
- Design and As Built reports and / or drawings
- Report comparing actual to base case footprint.

Additional Guidance

Monitoring and Modelling

Estimating water demand is an essential precursor to both water efficiency and reuse. A breakdown of water consumption for each key end use (such as erosion control or wash down) is necessary in order to plan how water use can be made more efficient (or potable water replaced by recycled or other water) for each end use.

To achieve Level 1, the water use must be monitored and modelled. The term modelling here refers to reasonable estimates or predictions. For a Design rating, this should be based on the detailed design. For the As-Built rating, monitoring of water use must be undertaken during construction, and modelling of water use must be undertaken for the operation phase based on the as-built infrastructure to give a total footprint across the infrastructure lifecycle. No base case footprint needs to be established for Level 1.

Smart Metering

Smart metering means using metering devices that allow real time water consumption monitoring. Smart meters can identify abnormalities and generate alarms so that actions can be taken to prevent or reduce losses. They also help to understand consumption patterns. While not a requirement of this credit, smart metering may be a helpful tool for water use monitoring.

Water Balance Study

 Undertaking a Water Balance Study is a suitable means to model the water use across the infrastructure lifecycle and therefore develop a water footprint. A Water Balance Study analyses and brings together the end
uses, the volumes required over time (technologies and behaviours), and the possible water sources. It allows the required water volumes and qualities over the different stages of a project/asset to be estimated. It can be readily constructed in a spreadsheet environment, and can be quite simple (‘back of the envelope’) or it can be more detailed.

Both water end uses and water sources should be identified and quantified using this, or a similar, method. Water end uses might include: office ablutions, user/workers ablutions, dust suppression, sub-grade stabilisation, moisture control of fills and pavement layers, wash down/cleaning, on-site manufacture, landscape irrigation/erosion control watering, water line testing, fire-fighting, equipment cooling and cleaning. Significant end uses are those that are likely to make up >5% of the total water use.

The water footprint should include the following summary figures (for each of the activities, where applicable to the phase):

- Total water use (expressed in ML) during delivery (i.e. design and construction) of the infrastructure.
- Monthly water use (in ML/month) during delivery of the infrastructure. These figures should be calculated over the entire delivery (design and construction) period.
- Annual operational water use (in ML/year) over the forecast useful life of the asset.
- Total water use (expressed in MLJ) over the full infrastructure lifecycle.

Footprint Scope

Footprints should include all water consumption from both potable and non-potable sources within the boundaries of the project/asset type. Water used outside the boundaries of the project/asset (i.e. concrete mixing by a third party) should not be included in the water footprint scope (note that this is covered as embedded water in the Materials category).

Reductions

This is a scaled credit. As noted above, no reduction is required to be demonstrated to achieve Level 1 (only monitoring and modelling). Where a reduction compared to a base case footprint is achieved, for every unit of reduction up to 20% for Level 3, fractions of Levels may be achieved on a sliding scale. For example, a 5% reduction would achieve Level 1 + (5% / 20%) x (3 – 1) = Level 1.5. This sliding scale approach provides encouragement to pursue every reduction opportunity possible. Reductions beyond 20% may be awarded innovation points.

See section on base case approach for more details.

Demand Management

Reduction in water use can be achieved through demand management. Demand management combines behavioural measures (e.g. responding to leakages, changing watering schedules, checking wind direction before positioning dust suppression equipment) and technical measures (e.g. improvements in machinery efficiency, improvements in nozzles/spray devices, products/additives that improve performance, provided additives do not incur other problematic impacts). Water efficiency is measured in volume of water per service.

Opportunity Analysis

Possible behavioural and/or technical measures that can be implemented to reduce business-as-usual water use include:

- General:
  - Implement a water management regime (e.g. timing during day/season to maximise natural rainwater infiltration and avoid evaporation of water where possible).
  - Avoid unnecessary use of water.
  - Develop a risk management plan, for example to avoid bursting onsite water mains/pipes, which could result in significant water losses.
  - Use sub-metering or smart metering to improve information and capacity to manage water use.
• Irrigation:
  - Plant native/drought-tolerant plants.
  - Install efficient irrigation technologies.
  - Use moisture-holding soils and mulches.
• Dust suppression: Where activities permit, changing activity schedules to match local conditions and increasing the effectiveness of the water use. Examples of how this may be done include:
  - Locate dust suppression spray devices to accommodate local wind conditions.
  - Water in cooler times of day to minimise evaporation.
  - Use a water ‘condenser/binder’.
  - Use covers to prevent wind erosion.
  - Use aeration fixtures to reduce water flow and maximise aerosol.
• Sub-grade stabilisation:
  - Use available binding agents to reduce water consumption.
• Wash down/cleaning:
  - Avoid washing down where unnecessary
  - Use water efficient ‘hoses’/aeration fixtures.
  - Recycle wash water where used for rough wash down of muddy vehicles.
• Temporary office/worker ablutions:
  - Install water efficient fixtures (taps, showers, washing machines etc.).
  - Install low/no water toilets/urinals
  - showers, washing machines etc.).

Implementation
It is recommended that all feasible opportunities are implemented.

Water Management Plan
It may be useful to incorporate identified opportunities into management plans. These should document:

• the process used to identify opportunities to reduce water use,
• a list of all the opportunities identified (with explanations),
• the process used to analyse and evaluate opportunities,
• commitments to implement particular opportunities during delivery and operation, and
• explanations of why other identified opportunities were not taken up.

Water reduction initiatives could also be incorporated into a sustainability opportunities (or initiatives) register, as discussed in Man-2 Risk and Opportunity Management.

Check online ISCA Guidance Repository for latest approved references.
DEVELOPING COUNTRIES

Wat-1 – Water use monitoring and reduction

**Aim**
To reward monitoring and minimising water use as much as possible across the infrastructure lifecycle.

**Criteria**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level &gt;1 to 3 on sliding scale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benchmark</strong></td>
<td><strong>Evidence</strong></td>
</tr>
<tr>
<td>Water reduction opportunities are fully investigated for the whole of life of the project. A water metering and monitoring strategy is implemented. AND One construction and one operational reduction initiatives as shown in Table 1 of this credit have been identified and implemented. AND A water security assessment is undertaken.</td>
<td>The requirements for Level 1 are achieved. The water metering and monitoring strategy is implemented. AND Reduction initiatives as shown in Table 1 of this credit have been identified and implemented. For every reduction initiative, up to 8 for Level 3, fractions of Levels may be achieved on a sliding scale. The evidence for Level 1. Design and As Built documentation showing the incorporation of the water reduction initiatives.</td>
</tr>
</tbody>
</table>

**Additional Guidance**

Developing countries have the option to use this credit or credit Wat-1 for developed countries.

**Opportunities Analysis**

For Level 1, water reduction opportunities should be fully investigated for the whole of life project. The water reduction opportunities include possible behavioural and/or technical measures. The opportunities analysis must include review of the initiatives listed in Table 1 as a minimum.

**Metering and Monitoring**

For Level 1, a water metering and monitoring strategy must be developed. Metering and monitoring of all major uses should be undertaken. These can include:

Construction:
- Water used for dust suppressions
- User/workers ablutions
- Sub-grade stabilisation
- Moisture control of fills and pavement layers
- Wash down/cleaning
- On-site manufacture
- Landscape irrigation/erosion control watering
- Water line testing
- Fire-fighting
- Equipment cooling and cleaning

Operation:
- Amenities (toilet flushing, showers)
- Commercial kitchens
- Rainwater/recycled water supply
- Fire test water supply
- General wash down

The types of metering and monitoring will vary across infrastructure types and phases.

**Smart Metering**

Smart metering means using metering devices that allow real-time water consumption monitoring. Smart meters can identify abnormalities and generate alarms so that actions can be taken to prevent or reduce losses. They also help to understand consumption patterns. While not a requirement of this credit, smart metering may be a helpful tool for water use monitoring.

**Water Security Assessment**

To achieve Level 1, projects must complete a water security assessment of potentially affected communities. The assessment will review and describe potential risks to water security (e.g., water supply issues) of these communities. For more information see Developing Countries Guidance in Man-7. To achieve Level 1, only an assessment is required. Should the risk assessment identify a potential impact to the local community, there must be an appropriate remedy for this risk implemented. Points can be achieved in Levels >1 to 3 if measures towards energy security are implemented.

**Reduction Initiatives**

This is a scaled credit. As noted above, no one construction and one operational reduction initiatives is required to be implemented to achieve Level 1. For each initiative, a sliding scale approach applies providing encouragement to pursue every opportunity possible, up to 8 initiatives where maximum points will be awarded (Level 3). The implementation of more than 8 initiatives may be awarded innovation points.

Specific initiatives must be identified by the project team based on the relevant risks and opportunities.

For points to be awarded initiatives must make a material impact on the overall energy use of the asset and this must be demonstrated.

The following formula can be used to work out the points achieved

\[ = 1 + (0.25 \times \text{number of initiatives}) \]

For small projects, a risk assessment is not required. Material reduction initiatives can be implemented based on qualitative identification.

Suggested optional initiatives have been listed for reference in Table 1.

**Demand Management**

Reduction in water use can be achieved through demand management. Demand management combines behavioural measures (e.g., responding to leakages, changing watering schedules, checking wind direction before positioning dust suppression equipment) and technical measures (e.g., improvements in machinery efficiency, improvements in nozzles/spray devices, products/additives that improve performance, provided additives do not incur other problematic impacts). Water efficiency is measured in volume of water per service.

**Implementation**

It is recommended that all feasible opportunities with a financial payback period of four years or less are implemented. However, for construction based opportunities, if the construction period is less than four years, then the payback period should be the construction duration rather than four years.

**Water Management Plan**

It may be useful to incorporate identified opportunities into management plans. These should document:

- the process used to identify opportunities to reduce water use,
- a list of all the opportunities identified (with explanations),
- the process used to analyse and evaluate opportunities,
- commitments to implement particular opportunities during delivery and operation, and
- explanations of why other identified opportunities were not taken up.

Water reduction initiatives could also be incorporated into a sustainability opportunities
(or initiatives) register, as discussed in Man-2 Risk and Opportunity Management. Check online ISCA Guidance Repository for latest approved references.

Table 1 Water saving opportunities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Water saving opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction</strong></td>
<td></td>
</tr>
<tr>
<td>C1</td>
<td>Implement a water management regime (e.g. timing during day/season to maximise natural rainwater infiltration and avoid evaporation of water where possible)</td>
</tr>
<tr>
<td>C2</td>
<td>Develop a risk management plan, for example to avoid bursting onsite water mains/pipes, which could result in significant water losses</td>
</tr>
</tbody>
</table>
| C3         | Dust suppression: Where activities permit, changing activity schedules to match local conditions and increasing the effectiveness of the water use. Examples of how this may be done include:  
- Locate dust suppression spray devices to accommodate local wind conditions.  
- Water in cooler times of day to minimise evaporation.  
- Use a water ‘condenser/binder’.  
- Use covers to prevent wind erosion.  
- Use aeration fixtures to reduce water flow and maximise aerosol |
| C4         | Use available binding agents to reduce water consumption for sub-grade stabilisation. |
| C5         | Use water efficient hoses and / aeration fixtures for wash down. |
| C6         | Temporary office/worker ablutions to have the water efficient fixtures and fittings:  
- Bathroom and toilet taps to have a flow rate of less than 4.5 litres/minute or have an automatic mechanism to turn off  
- Showers to have a flow rate of less than 7.5litres/minute  
- Toilets to be waterless or less than 4.5litres per flush  
- Urinals to be waterless or less than 0.4litres per flush |
| C7         | Water security of potentially affected communities is not being compromised by the construction of the project. |
| **Operation** |                           |
| O1         | Irrigation:  
- Plant native/drought-tolerant plants.  
- Install efficient irrigation technologies.  
- Use moisture-holding soils and mulches. |
| O2         | Water fixtures and fittings:  
- Bathroom and toilet taps to have a flow rate of less than 4.5 litres/minute or have an automatic mechanism to turn off  
- Showers to have a flow rate of less than 7.5litres/minute  
- Toilets to be waterless or less than 4.5litres per flush  
- Urinals to be waterless or less than 0.4litres per flush |
| O3 | Water security of potentially affected communities is not being compromised by the operation of the project. |
DEVELOPED COUNTRIES

Wat-2 Replace Potable Water

Aim
To reward replacing potable water where this makes economic and environmental sense across the infrastructure lifecycle.

Criteria

<table>
<thead>
<tr>
<th>Level 0 to 3 on sliding scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring and modelling demonstrates that some proportion of total water use is from non-potable sources (substituting for potable).</td>
</tr>
<tr>
<td>Fractions of Levels may be achieved on a sliding scale up to 100% for Level 3.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design reports.</td>
</tr>
<tr>
<td>Management plans.</td>
</tr>
<tr>
<td>Monitoring reports.</td>
</tr>
</tbody>
</table>

Additional Guidance

Potable water can be substituted with non-potable sources, such as rainwater, stormwater, reused water, recycled water. Substituting potable water with appropriate locally sourced non-potable water is an important part of infrastructure sustainability and is increasingly being adopted. The quality of the non-potable water supplied should match the quality required. That is, the non-potable source should not be over-treated (e.g. sewage treated to potable standard that is then used in dust suppression), nor under-treated (e.g. concrete batch quality is compromised by inappropriate water quality). The World Health Organisation provides guidelines for drinking water quality (see ISCA Guidance Repository). However, this level of treatment might not be required for all non-potable water uses. In the absence of a globally agreed standard, local requirements for water quality for different application should be used. For example, in Australia, there are different classes of recycled water suitable for different uses, as follows:

- **Class A:** Urban (non-potable): with uncontrolled public access. Agricultural: e.g. human food crops consumed raw. Industrial: open systems with worker exposure potential.

- **Class B:** Agricultural: e.g. dairy cattle grazing. Industrial: e.g. wash down water.

- **Class C:** Urban (non-potable) with controlled public access. Agricultural: e.g. human food crops cooked/processed, grazing/fooder for livestock. Industrial: systems with no potential worker exposure.

- **Class D:** Agricultural: non-food crops including instant turf, woodlots, flowers.

Similarly, the quantity of the non-potable water supplied should match the quantity required.

Substitutions

This is a scaled credit. Fractions of Levels may be achieved on a sliding scale up to 100% for Level 3. For example, a 40% substitution would achieve Level (40% / 100%) x 3 = Level 1.2. This sliding scale approach provides encouragement to pursue every reduction opportunity possible.

Approach

To effectively substitute potable water with other sources:
Specify water quality required for each end use – e.g. potable, non-potable (including any biochemical quality standards).
Identify potential supply from potable and non-potable water sources in terms of quantity (kL/d or ML/a) and quality (as above), and assess how these could match the end uses identified.
Assess costs for water provision from each potential alternative source (e.g. in $/kL).
Consider all life-cycle costs and impacts in all steps from extraction to use (e.g. energy, environmental costs as identified by Environmental or Social Impact Assessments if needed).

Lifecycle Impacts

Not all recycled water use is sensible. For example, some recycled water schemes lead to increased ecological impacts overall. This credit therefore also ensures water reuse is undertaken at a sensible location and scale – that is, in a way that has the least detrimental impact, and possibly even a positive impact.
From an environmental perspective, potable water should be replaced with new alternative sources only where the life-cycle impacts of extracting/sourcing, treating, piping/transporting and using non-potable water is about the same as or less than the impacts for potable water supply. The energy and GHG emissions impacts can be considered as Scope 3 emissions in Level 3 of the Energy and Carbon credit Ene-1. There may be case-by-case opportunities for projects which are close to each other to cooperate in water management and the intention of this credit is to encourage this.

Therefore:

Consider nearby non-potable water sources.
Assess life cycle costs and impacts of extraction and use (e.g. impacts from consuming the water resource, impacts from transport to site etc.).
Where it can be demonstrated that substituting for potable water for certain end uses has significantly negative environmental, social or economic impacts, then this potable water use can be excluded from the percentage substitution calculation.

Check online ISCA Guidance Repository for latest approved references.
DEVELOPING COUNTRIES

Wat-2 Replace Potable Water

Aim

To reward replacing potable water where this makes economic and environmental sense across the infrastructure lifecycle.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing Countries</td>
<td>One water recycling initiative is identified and implemented.</td>
<td>Two water recycling initiatives are identified and implemented, one during construction and one during operation.</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evidence</td>
<td>Design reports. Management plans.</td>
<td>Evidence as Level 1</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Additional Guidance

Potable water can be substituted with non-potable sources, such as rainwater, stormwater, reused water, recycled water. Substituting potable water with appropriate locally sourced non-potable water is an important part of infrastructure sustainability and is increasingly being adopted. The quality of the non-potable water supplied should match the quality required. That is, the non-potable source should not be over-treated (e.g. sewage treated to potable standard that is then used in dust suppression), nor under-treated (e.g. concrete batch quality is compromised by inappropriate water quality). Similarly, the quantity of the non-potable water supplied should match the quantity required.

Lifecycle Impacts

Not all recycled water use is sensible. For example, some recycled water schemes lead to increased ecological impacts overall. This credit therefore also ensures water reuse is undertaken at a sensible location and scale – that is, in a way that has the least detrimental impact, and possibly even a positive impact. From an environmental perspective, potable water should be replaced with new alternative sources only where the life-cycle impacts of extracting/sourcing, treating, piping/transporting and using non-potable water is about the same as or less than the impacts for potable water supply. The energy and GHG emissions impacts can be considered as scope 3 emissions in Level 3 of the Energy and Carbon credit Ene-1. There may be case-by-case opportunities for projects which are close to each other to cooperate in water management and the intention of this credit is to encourage this.

Therefore:

- Consider nearby non-potable water sources.
- Assess life cycle costs and impacts of extraction and use (e.g. impacts from consuming the water resource, impacts from transport to site etc.).
- Where it can be demonstrated that substituting for potable water for certain end uses has significantly negative environmental, social or economic impacts, then this potable water use can be excluded from the percentage substitution calculation.
Check online ISCA Guidance Repository for latest approved references.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Water replacement initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>C1 Rainwater harvesting is installed on temporary construction sheds to meet toilet flushing demands</td>
</tr>
<tr>
<td>Operation</td>
<td>O1 Rainwater harvesting is installed on temporary construction sheds to meet operational toilet flushing demands</td>
</tr>
<tr>
<td></td>
<td>O2 Greywater recycling is installed to meet toilet and general wash down demands</td>
</tr>
<tr>
<td></td>
<td>O3 Blackwater recycling is installed to meet all non-potable water demands</td>
</tr>
<tr>
<td></td>
<td>O4 Condensate water harvesting to meet irrigation demands</td>
</tr>
</tbody>
</table>
MATERIALS

The global demand for resources is forecast to rise significantly this century, driven by increasing population and the rapid economic growth of China and India. Increasing our resource efficiency (or ‘eco-efficiency’) is not only an environmental issue but will be vital to ensuring long-term economic prosperity for the global economy.

Eco-efficiency is defined by the World Business Council for Sustainable Development as “being achieved by the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the lifecycle, to a level at least in line with the Earth’s estimated carrying capacity”.

Infrastructure construction and operation consumes significant volumes of materials derived from natural resources – materials such as aggregates, concrete, steel, oil and wood. The processing and supply of these materials and their derivative products can have adverse environmental, social and economic impacts. The supplies of some of these resources are limited and are becoming increasingly scarce. It is important therefore that proper consideration is given to the responsible sourcing and efficient use of materials.

Construction of the built environment (buildings and infrastructure) is estimated to be responsible for upwards of 70% of total global materials flows (Ecospecifier). Materials used in construction impact on almost every aspect of sustainability. Examples of these impacts include:

- Raw-resource extraction impacts on the physical environment, for example through the cutting down of tropical forests for timber, or chemical spills from poorly managed mines for metal, paint or ceramic products.
- Depletion of non-renewable resources including oil, and the degradation of resource quality, for example the pollution of water sources.
- Greenhouse gas emissions from energy production in all stages of material manufacture and use.
- Waste leading to land fill burdens, some of them toxic.
- Emissions from products polluting indoor air over many years.
- Short term high-level emissions during construction (such as emissions from painting).
- Long-term health issues such as ground-water contamination due to leachates from landfill.

Sustainable materials consumption requires minimising the consumption of precious resources, optimising resource efficiency and reducing the environmental impacts of infrastructure through life cycle - cradle to cradle thinking. It involves a move towards a world where natural resources are consumed no faster than the planet can replenish them and where environmental pollution is released at a rate that lies within the earth’s carrying and rejuvenation capacity.

Across the infrastructure lifecycle there are many opportunities to influence the supply and use of materials – including through design, specification, selection, supply chain management, storage and use.

Moving to more sustainable materials consumption in the infrastructure industry means reducing the use of “new” materials. Residual needs should as far as possible be satisfied by re-used and recycled materials. Materials used should have durability appropriate to the asset lifecycle (i.e. fit for purpose), minimal inbuilt redundancy/failure and have minimal short or long term impacts on the environment. Maintenance issues and demolition/disposal and recyclability are also important considerations throughout the life of projects/assets. Materials selection should consider environmental aspects throughout the material lifecycle including energy aspects (i.e. embodied energy).

To fully assess materials in a sustainability context requires consideration of a complex set
of environmental, social and economic factors across a life-cycle perspective. The intent of this category is to encourage design and practice that minimises the consumption of precious resources, optimises resource efficiency and reduces the environmental impacts of infrastructure, ensuring that natural resources are consumed no faster than the planet can replenish them and that environmental pollution is released at a rate that lies within the earth’s carrying and rejuvenation capacity.

Internationally, it is acknowledged that life cycle (environmental) impact assessment (LCIA) is the most complete and appropriate way to assess the environmental impacts of material and resource use in all applications including infrastructure. Life cycle assessment (LCA) considers the processes used to win raw materials, transport them, process them into usable materials and products, construct or assemble them on-site, operate, maintain and refurbish the structures over their service life, dismantle and reuse, recycle or dispose of the component materials or products at the end of the infrastructure’s life.

ISCA pioneered the use of life cycle assessment for rating the materials used in infrastructure construction and operation. Extensive consultation was undertaken with both the material and product suppliers to the infrastructure industry and with infrastructure asset owners and designers in order to develop and refine the LCA approach.

In addition to the performance-based credit (Mat-1), there is a credit to promote the use of environmentally labelled products and stewardship by material and product suppliers (Mat-2).

The following two credits apply to the Materials category:

**Mat-1** Materials lifecycle impact measurement and reduction

**Mat-2** Environmentally labelled products and supply chains

Note that this category focuses on the products and materials that are used in infrastructure construction and operation, whereas the Procurement and Purchasing category focuses on the suppliers of goods and services.

Embodied energy and GHG emissions associated with materials are considered in this category, while the Energy and Carbon category focuses on energy use and GHG emissions produced directly by the activities undertaken during the construction and operations phases (and including indirect GHG emissions due to electricity consumption i.e. Scope 2).

The situation for water is similar: the embodied water associated with materials is considered in this category, while the Water category focuses on water used directly by the activities undertaken during the construction and operations phases.

There is a strong link to the Waste category since efforts to improve resource efficiency may also contribute to reductions in the amount of waste going to landfill. The focus of the Waste category is therefore the proper management of waste, diversion from landfill and deconstruction/disassembly/adaptation of infrastructure.
Mat-1 Materials lifecycle impact measurement and reduction

**Aim**
To reward design and practice that reduces lifecycle environmental impacts of materials.

**Criteria**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 1 to 3 on sliding scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark</td>
<td>The requirements for Level 1 are achieved. AND Monitoring and modelling demonstrates a reduction in materials lifecycle impacts compared to a base case footprint. For every reduction up to 30% for Level 3, fractions of Levels may be achieved on a sliding scale.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Completed copy of the Materials Calculator. The evidence for Level 1. AND Report comparing actual and modelled GHG emissions to a base case footprint.</td>
</tr>
</tbody>
</table>

**Additional Guidance**
The Level achieved is determined by using the IS International Materials Calculator. As emission factors for materials can vary significantly per region, ISCA will develop a materials calculator specific to the project. An equivalent lifecycle assessment technique may be used upon agreement with ISCA.

**Monitoring and Modelling**
To achieve Level 1, the materials environmental impact must be monitored and modelled. The term modelling here refers to reasonable estimates or predictions. For a Design rating, this should be based on the detailed design. For the As-Built rating, monitoring must be undertaken during construction and modelling of energy use and GHG emissions must be undertaken for the operation phase based on the as-built infrastructure to give a total footprint across the infrastructure lifecycle. No base case impact needs to be established for Level 1.

**Reductions**
No reduction is required to be demonstrated to achieve Level 1 (only monitoring and modelling). Where a reduction compared to a base case footprint is achieved, the Level is determined on a sliding scale from Level 1 to Level 3. Every 15% reduction achieves one level above Level 1, up to Level 3 for a 30% reduction. Fractions of levels are allowed, for example, a 10% reduction would achieve Level 1 + (20 / 15) x 1 = Level 2.33. This sliding scale approach provides encouragement to pursue every reduction opportunity possible. Reductions beyond 30% may be awarded innovation points.

See the section on Base Case Approach earlier in this chapter and the IS Materials Calculator Guideline for more details.

**Evidence**
Documentation must take the form of a completed copy of the Materials Calculator, dated and signed as a true record by the ‘engineer of record’ or other suitably qualified professional. ISCA may require proof of the claimed quantities and services used in the form of purchase requisitions and invoices for the project/asset.

Check online ISCA Guidance Repository for latest approved references.
Mat-2 Environmentally labelled products and supply chains

**Aim**

To reward procurement of major materials that have environmental labels or are from sustainable supply chains.

**Criteria**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark</td>
<td>One material/product has an ISCA approved environmental label.</td>
<td>3-9% of materials/products by value have an ISCA approved environmental label.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Report showing use of a product with the environmental credentials above.</td>
<td>The evidence for Level 1.</td>
</tr>
</tbody>
</table>

**Additional Guidance**

*This credit does not apply to the Design rating.*

It is not expected that materials procurement decisions will be advanced sufficiently at the design stage to allow verification.

Reward is given for the use of materials and products that have achieved certification by recognised environmental labelling bodies or stewardship schemes (Type I and Type III environmental labels).

Type I environmental labels are voluntary, multiple-criteria based, third party programs that award a license that authorises the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life cycle considerations.

Type II environmental labels are informative environmental self-declaration claims made about goods by their manufacturers, importers or distributors. They are not independently verified and do not use pre-determined and accepted criteria for reference. These labels are not recognised under this credit.

Environmental Product Declarations (EPDs) are Type III environmental declarations which provide valuable environmental impact data, and often capture the 'better than average' options available to industry, but they do not strictly compare products to other options like Type I labels do. For the purposes of this credit, EPDs must be third-party verified to be compliant with both ISO 14025 and EN 15804. The different levels coincide with different proportions of materials that have achieved the listed environmental labels.

For Level 1, the evidence must include a report describing:

- the product used and its environmental label(s), and
- the certificate for the product.

For Level 2 and Level 3, the evidence must include a report describing:

- the major materials used on the project and their value,
- for those products with environmental labels, the products used, their labels and their value,
- the proportion of the total material value of the project made up by products with environmental labels, and
• the certificates for the products

For Levels 2 and 3, in calculating performance, the value of any material/product with an environmental label must be multiplied by the corresponding sustainability factor (SF) listed in Figure A.

The materials or products with environmental labels must be used on the permanent infrastructure which makes up the project or asset. Materials or products used in temporary construction offices (e.g. construction office chairs) will not be accepted.

ISCA may independently verify the validity of the certificate from the certification body and may require proof of the claimed quantities in the form of purchase requisitions and invoices for the project. Other local and international schemes may be acceptable under this credit, as long as they comply with international certification standards. Projects should discuss suitability with ISCA prior to use.

Check online ISCA Guidance Repository for latest approved references.

Figure A: Sustainability Factors for ISCA Approved Environmental Labels

<table>
<thead>
<tr>
<th>ISCA approved environmental labels</th>
<th>Label Type</th>
<th>Sustainability Factor (SF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Stewardship Council (FSC) 100%</td>
<td>I</td>
<td>1.00</td>
</tr>
<tr>
<td>Programme for the Endorsement of Forest Certification (PEFC) 100%</td>
<td>I</td>
<td>1.00</td>
</tr>
<tr>
<td>Good Environmental Choice of Australia (GECA)</td>
<td>I</td>
<td>1.00</td>
</tr>
<tr>
<td>Ecospecifier Green Tag</td>
<td>I</td>
<td>1.00</td>
</tr>
<tr>
<td>ISEAL Alliance compliant whole supply chain Stewardship Scheme certification</td>
<td>I</td>
<td>1.00</td>
</tr>
<tr>
<td>Environmental Product Declarations – product-specific</td>
<td>III</td>
<td>0.75</td>
</tr>
<tr>
<td>Environmental Product Declarations – industry-wide</td>
<td>III</td>
<td>0.50</td>
</tr>
</tbody>
</table>
EMISSIONS, POLLUTION & WASTE

The twin pressures of population growth and resource consumption have caused emissions, pollution and waste over a long period resulting in degradation of our environment and loss of amenity. The construction and operation of infrastructure has been a significant contributor to this. In some cases, pollutants will persist in our environment for decades. It is recognised that some pollutants are being emitted faster than the planet can absorb them.

The Emissions, Pollution and Waste theme focus on understanding and measuring emissions, pollution and waste and their impacts, identifying and implementing feasible opportunities to reduce those impacts, and restoration to reverse past impacts.

The Emissions, Pollution and Waste theme contains the following categories:

- Discharges to Air, Land and Water (Dis)
- Land (Lan)
- Waste (Was)
DISCHARGES TO AIR, LAND AND WATER

Population growth and resource consumption have caused pollution over a long period resulting in degradation of our environment and loss of amenity. To address this, governments have increasingly sought to reduce and limit polluting activities.

There are several types of pollution from infrastructure that can cause harmful impacts to the environment and communities, for example:

- Pollution of waterways harms ecosystems by disrupting their natural balance. This can lead to loss of biodiversity and of ecosystem services such as water supply and recreation. It is projected that nutrient pollution from urban wastewater (and agriculture) will worsen in most regions of the world, intensifying eutrophication and damaging aquatic biodiversity (OECD, 2012).
- Noise and vibration can intrude on community amenity and in severe cases contribute to psychological effects or hearing damage. Vibration can also impact on buildings, including heritage buildings, and on sensitive industries.
- Air pollution causes respiratory effects and in extreme events illness and death, particularly in urban areas. The OECD (2012) predict that air pollution will become the world’s top environmental cause of premature mortality by 2050.
- Light pollution can disturb neighbours and disrupt the habits of migratory species, nocturnal animals and insects.

More needs to be done to reduce or eliminate these impacts and encourage restoration whereby past impacts are reversed.

The infrastructure industry, particularly transport and construction sectors, is a significant source of pollution. Emissions and discharges from infrastructure may be potentially significant, especially in sensitive locations. Discharges to air may include:

- Dust from clearing, crushing, traffic and general site operations
- Combustion emissions from plant, equipment and vehicles (note that greenhouse gas emissions are addressed in the Energy and Carbon category)
- Emissions from specific site processes, including abrasive blasting and painting
- Odours from site operations or facilities, including temporary wastewater treatment plants
- Discharges into water bodies may include discharges to inland or coastal waters, or to groundwater, from:
  - spills from diesel, chemical and waste storage facilities, or from plant and vehicles,
  - spills or releases from sewage or temporary effluent treatment plants, vehicle washes and general cleaning,
  - releases of soil from erosion during storms and from construction activity,
  - residue in runoff from hard surfaces such as roads and
  - discharges from wastewater treatment plants.

Noise and vibration may be generated by:

- vehicle movements including reversing alarms,
- rock-breaking and piling,
- use of explosives for blasting,
- radios, broadcast systems and worker chatter and
- tunnelling machinery.

Light pollution may be caused by:

- temporary construction lighting for night work,
- road, station, pedestrian or car park lighting and
- building lighting.

Infrastructure designers, constructors and operators have compliance programs which aim to achieve compliance with laws and standards covering environmental issues such as pollution.
Various factors have been driving efforts to improve environmental management in infrastructure projects, including:

- Regulatory demands - management plans for addressing potential impacts are a condition of approval for major projects, or projects in sensitive locations.
- Risks of fines and harm to reputation from improper management where discharges impact on the external environment.
- Costs - high costs of clean up and disruption to activities.

Various guidelines have been produced to encourage best practice in infrastructure environmental management. There are extensive international general and issue-specific guidelines produced by regulatory, industry and other bodies on best environmental practice which may be relevant to infrastructure. The approach to compliance and operating in accordance within legal limits is generally rigorous, however, there has been less effort to go beyond compliance, to eliminate impacts and to undertake restorative actions to reverse historical impacts.

The IFC General EHS Guidelines include management measures around controlling environmental impacts from projects, such as impact on water quality, air and noise. See ISCA guidance repository. Other useful documents include the Australian Civil Contractors Federation Environmental Guidelines for Civil Construction (CCF 2010) which is a useful industry guide for managing environmental aspects including discharges and pollution. Some examples of management measures in the guide include:

- Preventing or reducing air pollution through:
  - use of low emissions or energy efficient vehicles, plant and equipment, including renewable energy sources and
  - efficient use e.g. optimal sizing of plant, minimising vehicle movements.
- Preventing pollution from chemicals or waste:
  - Appropriate operations, storage and handling of fuels, chemicals and hazardous waste e.g. away from sensitive areas.
  - The use of bundling, spill kits, impervious liners and personnel trained in spill response.
- Dust control:
  - Appropriate use of water for dust control.
  - Retention of existing vegetation; area of cleared land minimised.
  - Access and haul road design, construction and operation and maintenance.
  - Use of matting for stabilisation and erosion control.
- Wastewater treatment: Preventing pollution from wastewater (from toilets, vehicle washing, concrete plant and other processes):
  - Wastewater treatment plants.
  - Settlement ponds etc.
- Protection of land and waterways: Drainage control for site:
  - Catch drains, earth banks (or cut off drains).
  - Energy dissipaters at discharge points.
- Sediment control, Waterways and floodplains protection:
  - Stream diversion.
  - Use of measures recommended by CCF for horizontal directional drilling near waterways.
- Sediment control; Water quality monitoring:
  - Monitoring for turbidity, pH, EC, DO, temperature, suspended solids, chemical and biological pollution as applicable.
- Noise and vibration control:
- Location and orientation to avoid noise nuisance to neighbours and other sensitive receptors.
- Design and use of temporary and permanent noise barriers.

- Light control:
  - Location and orientation to avoid light disturbance to neighbours and fauna (e.g. away from turtle nesting beaches and bird roosting sites).
  - Use of luminaires which are not unnecessarily bright and use of low reflectance coatings where reflection is an issue.

This category assesses the level and effectiveness of management practices for preventing and mitigating discharges to air, water and land over the life cycle of a given piece of infrastructure. It also seeks to encourage initiatives to enhance natural capital.

The following five credits apply to the Discharges to Air, Land and Water category:

- **Dis-1** Receiving water quality
- **Dis-2** Noise
- **Dis-3** Vibration
- **Dis-4** Air quality
- **Dis-5** Light Pollution

There are multiple links to other Categories, in particular:

- Discharges may impact on the health, wellbeing and safety of the community (Community Health, Wellbeing and Safety category).
- Discharges may impact on biodiversity (Ecosystems and Biodiversity category).
- Discharges to water may impact on water resources (Water category).
- Discharges to land may impact on land form and management (Land category).

Greenhouse gas emissions from vehicles, plant and machinery are covered under the Energy and Carbon category.
Dis-1 Receiving Water Quality

**Aim**

To reward the management of impacts on local receiving water quality.

**Criteria**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures to minimise adverse impacts to receiving water quality values during construction and operation have been identified and implemented. AND Monitoring of water discharges and receiving waters is undertaken at appropriate intervals and at times of discharge during construction and operation. AND Baseline studies should be undertaken and impact predictions established to inform the management process and measures.</td>
<td>The requirements for Level 1 are achieved. AND Monitoring and modelling of water discharges and receiving waters demonstrates no adverse impact on receiving water quality values.</td>
<td>The requirements for Level 2 are achieved. AND Opportunities to improve receiving water quality values have been identified and implemented. AND Monitoring and modelling demonstrates improvement of receiving water quality values.</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Guidance**

Water Quality for Ecosystem and Human Health from UN GEMS/Water Programme Office presents assessments of water quality status and trends. It also provides an introduction to a diverse range of global water quality issues, including approaches to their identification, analysis and resolution. See ISCA guidance repository.

Receiving water refers to the impacts from water discharges from a project or asset onto downstream receiving water bodies. According to IFC’s General EHS Guidelines: Environmental, Wastewater and Ambient Water Quality, water discharge could happen to surface water, or sanitary sewer systems.

Where sewerage collection networks do not exist, septic system are common. Downstream receiving water bodies include groundwater below or down gradient to the project/asset site and potentially impacted by discharges or other activities. Receiving water quality values are defined as: ‘particular values or uses of the environment that are important for a healthy ecosystem or for public benefit, welfare, safety or health and that require protection from the effects of pollution, waste discharges and deposits. Several values may be designated for a specific waterbody’. (ANZECC, 2000)

Receiving Water quality values may cover the following uses:

- aquatic ecosystems,
• recreational water quality and aesthetics,
• water bodies used for community needs, e.g. washing
• water bodies with cultural value
• raw water for drinking water supplies,
• agricultural water use and
• industrial water use.

Management Process

The process for water quality management uses the concept of values to set local water quality targets. These targets are usually established by government and regulatory bodies, either directly or in partnership with the community. Different objectives are set depending on the type of receiving water body (Source, IFC):

Discharge to Surface Water

• Process wastewater treatment standards consistent with applicable Industry Sector EHS Guidelines. Projects for which there are no industry-specific guidelines should reference the effluent quality guidelines of an industry sector with suitably analogous processes and effluents;
• Compliance with national or local standards for sanitary wastewater discharges;
• Temperature of wastewater prior to discharge does not result in an increase greater than 3°C of ambient temperature at the edge of a scientifically established mixing zone which takes into account ambient water quality, receiving water use and assimilative capacity among other considerations.

Sanitary Sewer Systems Meet the pretreatment and monitoring requirements of the sewer treatment system into which it discharges.
• Not interfere, directly or indirectly, with the operation and maintenance of the collection and treatment systems, or pose a risk to worker health and safety, or adversely impact characteristics of residuals from wastewater treatment operations.
• Be discharged into municipal or centralized wastewater treatment systems that have adequate capacity to meet local regulatory requirements for treatment of wastewater generated from the project. Pretreatment of wastewater to meet regulatory requirements before discharge from the project site is required if the municipal or centralized wastewater treatment system receiving wastewater from the project does not have adequate capacity to maintain regulatory compliance.

Septic systems

• Properly designed and installed in accordance with local regulations and guidance to prevent any hazard to public health or contamination of land, surface or groundwater. • Well maintained to allow effective operation.
• Installed in areas with sufficient soil percolation for the design wastewater loading rate.
• Installed in areas of stable soils that are nearly level, well drained, and permeable, with enough separation between the drain field and the groundwater table or other receiving waters.

After all available information has been collated for a defined water body, the steps listed below should be followed to address receiving waters at a local level (IFC, Environmental, Health, and Safety (EHS) Guidelines, Environmental Wastewater and ambient water quality):

• Understand the quality, quantity, frequency and sources of liquid effluents in the project’s installations. This includes knowledge about the locations, routes and integrity of internal drainage systems and discharge points
• Plan and implement the segregation of liquid effluents principally along industrial, utility, sanitary, and stormwater categories, in order to limit the volume of water requiring specialized treatment. Characteristics of individual streams may also be used for source segregation.
• Identify opportunities to prevent or reduce wastewater pollution through such measures as recycle/reuse within their facility, input substitution, or process modification (e.g. change of technology or operating conditions/modes).
Assess compliance of their wastewater discharges with the applicable: (i) discharge standard (if the wastewater is discharged to a surface water or sewer), and (ii) water quality standard for a specific reuse (e.g. if the wastewater is reused for irrigation).

In many cases of infrastructure development or operation, water quality objectives will have already been established by regulators and may be communicated through approval conditions and/or licenses.

Baseline studies should be undertaken and impact predictions established to inform the management process and measures. These studies should consider seasonal and rainfall effects, representative sampling and links to activities in the catchment likely to affect the baseline.

According to IFC’s Environmental, Health, and Safety (EHS) Guidelines, Environmental Wastewater and ambient water quality, the generation and discharge of wastewater of any type should be managed through a combination of:

- Water use efficiency to reduce the amount of wastewater generation
- Process modification, including waste minimization, and reducing the use of hazardous materials to reduce the load of pollutants requiring treatment
- If needed, application of wastewater treatment techniques to further reduce the load of contaminants prior to discharge, taking into consideration potential impacts of cross-media transfer of contaminants during treatment (e.g., from water to air or land)

Measures must be documented in management plans such as Construction and Operational Environmental Management Plans or specific Water Management Plans or similar.

Implementation of measures could be demonstrated by design reports, as-built drawings, environmental management plans and asset management plans as appropriate. Where this credit has low Materiality, monitoring of receiving water quality is not required for Level 1.

Monitoring

The wastewater and water quality monitoring program should consider the following elements (IFC, Environmental, Health, and Safety (EHS) Guidelines, Environmental Wastewater and ambient water quality):

- **Monitoring parameters**: The parameters selected for monitoring should be indicative of the pollutants of concern from the process, and should include parameters that are regulated under compliance requirements;
- **Monitoring type and frequency**: Wastewater monitoring should take into consideration the discharge characteristics from the process over time. Monitoring of discharges from processes with batch manufacturing or seasonal process variations should take into consideration of time-dependent variations in discharges and, therefore, is more complex than monitoring of continuous discharges. Effluents from highly variable processes may need to be sampled more frequently or through composite methods. Grab samples or, if automated equipment permits, composite samples may offer more insight on average concentrations of pollutants over a 24-hour period. Composite samplers may not be appropriate where pollutants of concern are short-lived (e.g. quickly degraded or volatile).
- **Monitoring locations**: The monitoring location should be selected with the objective of providing representative monitoring data. Effluent sampling stations may be located at the final discharge, as well as at strategic upstream points prior to merging of different discharges. Process discharges should not be diluted prior or after treatment with the objective of meeting the discharge or ambient water quality standards.
- **Data quality**: Monitoring programs should apply internationally approved methods for sample collection, preservation and analysis. Sampling should be conducted by or under the supervision of trained individuals. Analysis should be conducted by entities permitted or certified for this
purpose. Sampling and Analysis Quality Assurance/Quality Control (QA/QC) plans should be prepared and, implemented. QA/QC documentation should be included in monitoring reports.

No Adverse Impact

To demonstrate no adverse impact to receiving water quality values, the requirements listed in IFC’s Environmental, Health, and Safety (EHS) Guidelines, Environmental Wastewater and ambient water quality, under “General Liquid Effluent Quality”, should be met. In some cases, it may be possible to show no adverse impact even though there have been exceedances but this would require incident investigations to demonstrate:

- no disruption or degradation of environmental values,
- no exceedance of license limits, and
- improvements to practices have been implemented to prevent recurrence.

If water quality values are exceeded, the onus is on the assessor to demonstrate that this has not resulted in ‘disruption to the regular uses or values of the receiving water’. This could be evidence based on discussions with the notified entities. Examples of disruptions include closure of a recreational site, an inability to use the water for irrigation/drinking supply/stock watering or other uses, ceasing commercial fishing, or other interruptions to the ability to fully utilise the receiving water in ways it is normally used. ‘Degradation’ to the receiving water environment could be measurable through noticeable changes in system ecology such as harm or reduction in numbers of native fish, macro-invertebrates or riparian vegetation.

Enhancing Environmental Values

An improvement to receiving water quality values could be demonstrated by a modelled or measured long-term trend of improvement to receiving water quality and positive impact on quality values. A long-term trend would need to be demonstrated on a rolling 12 month average basis.

Local equivalent

Where local requirements on water discharge exist, these should be met. Relevant licenses from the local authority can be used as evidence to comply with the credit criteria Level 1. In this case, project must demonstrate that the local equivalent is more stringent than IFC’s Guidelines and meets all credit criteria.

Where this credit has low Materiality, if improvements are made to stormwater management that result in improvements to receiving water quality, this need only be demonstrated through a qualitative assessment and monitoring of the receiving water is not required.

Check online ISCA Guidance Repository for latest approved references.
Dis-2 Noise

Aim
To reward the management of noise impacts.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures to mitigate noise during construction and operation have been</td>
<td>The requirements for Level 1 are achieved.</td>
<td>The requirements for Level 2 are achieved.</td>
<td>The requirements for Level 3 are achieved.</td>
</tr>
<tr>
<td>identified and implemented.</td>
<td>AND For construction, modelling and monitoring demonstrates no recurring or major divergences from the noise management processes in relevant local guidelines.</td>
<td>AND For construction, modelling and monitoring demonstrates no divergences from the noise management processes in relevant local guidelines.</td>
<td>AND For operation, modelling and monitoring demonstrate no exceedances of noise goals.</td>
</tr>
<tr>
<td>Monitoring of noise is undertaken at appropriate intervals and in response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to complaints during construction and operation.</td>
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<td></td>
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<tr>
<td>AND Baseline studies should be undertaken and impact predictions</td>
<td></td>
<td></td>
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<tr>
<td>established to inform the management process and measures.</td>
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<td></td>
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</tbody>
</table>

Additional Guidance

Measures may come from an environmental impact assessment or similar process. Baseline studies should be undertaken and noise predictions established to inform the management process and measures.

Measures must be documented in management plans such as Construction and Operational Environmental Management Plans or specific Noise Management Plans or similar.

Implementation of measures could be demonstrated by design reports, as-built drawings and asset management plans as appropriate.

Noise Goals

Noise goals are limits that must not be exceeded or noise levels that projects aim to keep within. They are sometimes referred to as limits, objectives or criteria. They are normally levels at sensitive receiver locations and are measured in dBA. There are different measures of noise levels relating to different noise level statistics e.g. $L_{Aeq}$, $L_{A10}$, $L_{Amax}$.

Noise goals are typically based on achievable noise levels which have been predicted can be met. Noise goals should be determined based on relevant regulations and the advice of a qualified acoustic specialist. A typical noise goal might be to not exceed the background noise level by more than 5 dBA. There may be different noise goals for different locations, times of day, receiver types and activities (noise types). Country specific or IFC’s Environmental, Health, and Safety (EHS) Guidelines, General EHS Guidelines: Construction And Decommissioning and General EHS Guidelines: Occupational Health And Safety noise goals can be used (whichever is more stringent). If local guidelines are to be used, approval from ISCA should be sought for their use, unless they are already listed in the ISCA.
online repository. IFC Guidelines goals are shown below (IFC’s Environmental, Health, and Safety (EHS) Guidelines, Environmental Noise Management):

- Noise impacts should not exceed the levels presented in the table below, or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site:

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Daytime 07:00 - 22:00</th>
<th>Nighttime 22:00 - 07:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential, institutional,</td>
<td>55</td>
<td>45</td>
</tr>
<tr>
<td>educational**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial, commercial</td>
<td>70</td>
<td>70</td>
</tr>
</tbody>
</table>

Highly intrusive noises, such as noise from aircraft flyovers and passing trains, should not be included when establishing background noise levels.

If there are no country specific noise goals, then the IFC Guidelines should be used to achieve this credit.

**Monitoring**

Monitoring at appropriate intervals could also include during high risk activities e.g. night works.

When undertaking noise monitoring (particularly to check for compliance with a standard), it is imperative that the measured noise level is representative of the noise emissions from the activity being considered, and that the impacts of extraneous noise (e.g. from road traffic, aircraft noise, or other industrial sources) are excluded from the measurements.

In some situations, it is not practical to use unattended noise loggers to monitor noise, because it is difficult to determine what, exactly, is causing the ‘offending’ noise. In those situations, it is appropriate to adopt alternative noise measurement techniques such as:

- Using directional unattended noise loggers, which can exclude noise from certain directions – some mine sites adopt this approach, but it is expensive, and not appropriate for all situations.
- Undertaking some attended noise measurements to enable the ‘offending’ noise to be positively identified more readily – but there are even some situations where attended measurements can pose practical difficulties.
- Undertaking derived point compliance measurements (i.e. measuring in representative locations nearer to the noise source, for example, and back-calculating noise levels at receivers).
- Further guidance on monitoring can be found in IFC’s Guidelines. See ISCA guidance repository.

**Exceedances**

Exceedances are measured noise levels greater than 2 dBA above the noise goals. Recurring exceedances are defined as more than two exceedances of a similar nature within a 12 month period. Major exceedances are defined as exceeding noise goals or objectives by more than 10 dBA.

**Construction**

The noise management process for construction involves complying with appropriate noise goals wherever possible, and when noise is predicted to exceed the goals, to implement additional mitigation measures.

Where potential construction noise impacts of a project are expected to be minor (but not nil), the qualitative method for assessing and managing construction noise can be used. This method focusses on community engagement and managing noise impacts through feasible and reasonable management measures. It is a simplified way to identify the cause of potential construction noise impacts and, where appropriate, avoids the need to perform complex noise predictions by using a checklist approach for assessing and managing noise.

The qualitative assessment method can be applied to projects involving the following (or similar) activities:

- Short-term infrastructure maintenance (not likely to affect an individual or sensitive land use for more than three weeks in total).
- Small construction projects in rural areas which may not generate
significant noise at surrounding residences due to the typically large distances involved.

The assessor must provide evidence to show that the requirements of the guideline have been met.

Where the materiality score for noise is low and the qualitative method has been appropriately applied, then the Level 1 benchmark will apply and this can receive full points for the credit, subject to meeting operational noise benchmarks.

**Divergence**

A divergence from the noise management process is defined as a goal being predicted to be exceeded and one or more of the relevant mitigation measures not being implemented. Implemented means implemented as part of the relevant construction activity, rather than in response to monitoring ‘discovering’ an exceedance.

A recurring divergence is defined as more than two divergences of a similar nature within a 12 month period. A major divergence is defined as a noise goal being predicted to be exceeded by more than 10 dBA and one or more of the additional mitigation measures not being implemented.

Monitoring should include auditing of the implementation of additional mitigation measures where noise goals are predicted to be exceeded.

**Local equivalent**

Where local requirements on water discharge exist, these should be met. Relevant licenses from the local authority can be used as evidence to comply with the credit criteria Level 1. In this case, project must demonstrate that the local equivalent is more stringent than IFC’s Guidelines and meets all credit criteria.

Check online ISCA Guidance Repository for latest approved references.
**Dis-3 Vibration**

**Aim**

To reward the management of vibration impacts.

**Criteria**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark</td>
<td>Measures to mitigate vibration during construction and operation have been identified and implemented. AND Monitoring of vibration is undertaken at appropriate intervals and in response to complaints during construction and operation. AND Baseline studies should be undertaken and impact predictions established to inform the management process and measures.</td>
<td>The requirements for Level 1 are achieved. AND For construction, modelling and monitoring demonstrates no exceedances of vibration goals for structural damage to buildings and structures. AND For operation, modelling and monitoring demonstrates no recurring or major exceedances of vibration goals for human comfort criteria. AND No physical damage has been caused to any buildings or structures by vibration caused by construction or operation.</td>
</tr>
</tbody>
</table>


**Additional Guidance**

Measures may come from an environmental impact assessment or similar process. Baseline studies should be undertaken and vibration predictions established to inform the management process and measures. Dilapidation surveys can also support baseline studies.

Measures may be documented in management plans such as Construction and Operational Environmental Management Plans or specific Vibration Management Plans or similar.

Implementation of measures could be demonstrated by design reports, as-built drawings and asset management plans as appropriate.

**Monitoring**

Monitoring at appropriate intervals could also include during high risk activities e.g. rolling for compaction. Where vibration has low Materiality, monitoring is only required in response to complaints. In this case only Level 1 applies and this receives the full points for the credit. Verifiers will determine whether the monitoring is appropriate. They should take into account the nature of vibration, objectivity, repeatability, probably of identifying vibration impacts, complaints and complaint management and meeting the intent of the credit.
Goals

Vibration goals are limits that must not be exceeded or vibration levels which the project aims to keep within. They are sometimes referred to as limits, objectives or criteria. They are normally levels at sensitive receiver locations and are measured in mm/s (velocity), mm/s² (acceleration) or Vibration Dose Value (VDV). Vibration goals should be determined based on relevant regulations and the advice of a qualified acoustic specialist. Construction vibration goals are typically set to meet two objectives:

1. To maintain human comfort in buildings affected by the construction. British Standard BS 6472:2008 is often referred to.
2. To avoid damage to buildings affected by construction vibration. German Standard DIN 4150 and British Standard BS 7385: Part 2 1993 are often referred to.

There may be different vibration goals for different times of day, receiver types and activities. Activities may result in different vibration frequencies and natures – continuous, impulsive or intermittent. If there are no project or asset specific vibration goals, then Level 2 and Level 3 cannot be achieved. Vibration goals may be set voluntarily, for example if they are not regulated.

Exceedances

Exceedances are measured vibration levels above the vibration goals. Recurring exceedances are defined as more than two of a similar type within a 12 month period. Major exceedances are defined as more than doubling the vibration goals.

Local equivalent

Where local requirements on water discharge exist, these should be met. Relevant licenses from the local authority can be used as evidence to comply with the credit criteria Level 1. In this case, project must demonstrate that the local equivalent is more stringent than IFC’s Guidelines and meets all credit criteria.

Check online ISCA Guidance Repository for latest approved references.
Dis-4 Air Quality

Aim

To reward management of air quality impacts.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Measures to minimise adverse impacts to local air quality during construction and operation have been identified and implemented. AND Monitoring of air emissions and/or air quality is undertaken at appropriate intervals and in response to complaints during construction and operation. AND Baseline studies should be undertaken and impact predictions established to inform the management process and measures.</td>
<td>The requirements for Level 1 are achieved. AND Monitoring and modelling demonstrates no recurring or major exceedances of air emission or air quality goals.</td>
<td>The requirements for Level 2 are achieved. AND Monitoring and modelling demonstrates no exceedances of air emission or air quality goals.</td>
</tr>
</tbody>
</table>

Additional Guidance

Measures may come from an environmental impact assessment or similar process. Baseline studies should be undertaken and air quality predictions established to inform the management process and measures.

Measures must be documented in management plans such as Construction and Operational Environmental Management Plans or specific Air Quality Management Plans or similar.

Implementation of measures could be demonstrated by design reports, as-built drawings and asset management plans as appropriate.

Monitoring

Monitoring at appropriate intervals could also include during high risk activities e.g. tunnelling.

The air quality monitoring program should consider the following elements (IFC’s Guidelines Environmental, Health, and Safety Guidelines General EHS Guidelines:

- **Environmental Air Emissions And Ambient Air Quality):**
  - **Monitoring parameters:** The monitoring parameters selected should reflect the pollutants of concern associated with project processes. For combustion processes, indicator parameters typically include the quality of inputs, such as the sulfur content of fuel.
  - **Baseline calculations:** Before a project is developed, baseline air quality monitoring at and in the vicinity of the site should be undertaken to assess background levels of key pollutants, in order to differentiate between existing ambient conditions and project-related impacts.
  - **Monitoring type and frequency:** Data on emissions and ambient air quality generated through the monitoring program should be representative of the emissions discharged by the project over time.
Examples of time-dependent variations in the manufacturing process include batch process manufacturing and seasonal process variations. Emissions from highly variable processes may need to be sampled more frequently or through composite methods. Emissions monitoring frequency and duration may also range from continuous for some combustion process operating parameters or inputs (e.g., the quality of fuel) to less frequent, monthly, quarterly or yearly stack tests.

- **Monitoring locations:** Ambient air quality monitoring may consist of off-site or fence line monitoring either by the project sponsor, the competent government agency, or by collaboration between both. The location of ambient air quality monitoring stations should be established based on the results of scientific methods and mathematical models to estimate potential impact to the receiving airshed from an emissions source taking into consideration such aspects as the location of potentially affected communities and prevailing wind directions.

- **Sampling and analysis methods:** Monitoring programs should apply national or international methods for sample collection and analysis, such as those published by the International Organization for Standardization,26 the European Committee for Standardization,27 or the U.S. Environmental Protection Agency.28 Sampling should be conducted by, or under, the supervision of trained individuals. Analysis should be conducted by entities permitted or certified for this purpose. Sampling and analysis Quality Assurance / Quality Control (QA/QC) plans should be applied and documented to ensure that data quality is adequate for the intended data use (e.g., method detection limits are below levels of concern). Monitoring reports should include QA/QC documentation.

Where the materiality score for this credit is low, qualitative monitoring is acceptable. Qualitative monitoring could include visual monitoring for dust or monitoring by smell for odours for example. It needs to be regular, recorded, and cover the geographical and temporal scope of the project and its impacts.

**Goals**

Air emission or air quality goals are limits that must not be exceeded or levels that the project aims to keep within. They are sometimes referred to as limits, objectives, criteria or standards. Air quality goals are levels at sensitive receiver (ambient) locations while air emission goals are levels at the discharge point from the infrastructure site (e.g., a tunnel vent facility). They may relate to different airborne pollutants such as particulate matter (PM), Carbon monoxide or Nitrogen dioxide.

Air emission or air quality goals should be based on “IFC’s Guidelines Environmental, Health, and Safety Guidelines General EHS Guidelines: Environmental Air Emissions And Ambient Air Quality” or on regional objectives whichever is more stringent. If there are no project or asset specific air emission or air quality goals, then Level 2 and Level 3 cannot be achieved. Air emission or air quality goals may be set voluntarily, for example if they are not regulated. Greenhouse Gas emissions are not in the “Ene-1 Energy and Carbon Monitoring and Reduction” credit and can be excluded from this credit.

**Exceedances**

Exceedances are measured air emission or air quality levels above the goals. Recurring exceedances are defined as more than two of a similar type within a 12 month period. Major exceedances are defined as exceeding the air emission or air quality goals by more than 50%.

**Local equivalent**

Where local requirements on water discharge exist, these should be met. Relevant licenses from the local authority can be used as evidence to comply with the credit criteria Level 1. In this case, project must demonstrate that the local equivalent is more stringent than IFC’s Guidelines and meets all credit criteria.

Check online ISCA Guidance Repository for latest approved references.
Dis-5 Light pollution

Aim

To reward prevention of light spill.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Measures to prevent light spill during construction and operation have been identified and implemented. AND The lighting design for operation prevents upward light spill by ensuring that, relative to its particular mounting orientation, 95% (by number) of external public lighting luminaires within the project boundary have an Upward Light Ratio less than 5% (for roads and public spaces this must be less than 3%).</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evidence</td>
<td>Design report, as-built drawings, environmental management plan, asset management plan. Monitoring reports.</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Additional Guidance

Implementation can be demonstrated by design reports, as-built drawings, environmental management plans and asset management plans as appropriate.

Light reflected off external surfaces (which do not form part of the light fitting) is not considered light spill in relation to this credit.

Construction Lighting

For construction activities, the sensitive receivers should be identified, and luminaires be aimed away from these areas. Direct views from these areas towards luminaires should also be minimised.

Evidence should show how mitigation measures for any sensitive receptors have been applied for any construction related light sources and a night time audit must be undertaken during the construction phase.

Additionally, where complaints have been received, evidence must show that these have been appropriately managed, including implementing mitigation measures.

Operation Lighting

The following methods can be used to demonstrate prevention of light spill in operation:

- For Design ratings, a lighting desktop study (modelling or calculations) to identify whether and where sensitive receptors (residential and commercial dwellings and ecologically sensitive areas) may be impacted by light spill. The studies must demonstrate compliance with the horizontal light spill and upward light ratio criteria.
- For As Built ratings, the Design rating desktop study should also be supported by a night time defects inspection which shows no lighting defects (or that such
defects are rectified). This inspection should include some spot measurements of horizontal light spill (it is not practical to measure upward light spill).

In areas that are highly urbanised with numerous light sources, it may not be possible or useful to monitor project/asset light sources in isolation from the surrounds. In these situations, design and installation information can be used to demonstrate achievement of the benchmark requirement.

Compliance with this credit can be demonstrated by using local equivalent Guides or The Institution of Lighting Engineers, Guidance notes for the reduction of obtrusive light or International Commission on Illumination CIE 150:2003 Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations.

Check online ISCA Guidance Repository for latest approved references.

Figure 1 Light spill and trespass sources (Source The Institution of Lighting Engineers)
LAND

The Food and Agriculture Organisation (FAO) of the United Nations recognises that Land is an essential natural resource, both for the survival and prosperity of humanity, and for the maintenance of all terrestrial ecosystems. Over millennia, people have become progressively more expert in exploiting land resources for their own ends. The limits on these resources are finite while human demands on them are not. Increased demand, or pressure on land resources, shows up as declining crop production, degradation of land quality and quantity, and competition for land. Attention should now be focused on the role of humankind as stewards rather than exploiters, charged with the responsibility of safeguarding the rights of unborn generations and of conserving land as the basis of the global ecosystem.

While infrastructure by its very nature provides economic, social and/or environmental benefits, it may compete for land with alternative uses which are also highly valued particularly by local communities. Local communities are also sometimes the ones in society who receive less benefit from the infrastructure. For example, a motorway running through an urban area may reduce commuting times for people in more distant locations but it may also divide a suburb and cause loss of local vegetation.

Land use decisions and land management are therefore critical to achieving sustainable outcomes for infrastructure.

When it comes to planning and delivery of infrastructure projects, route and site selection must critically incorporate careful consideration of land uses, stakeholder consultation and reference to relevant strategic plans. In urban areas, issues include reducing pressure on greenfield sites, remediation of land contamination, re-use of derelict land and urban regeneration. In rural areas, issues include conservation of specific land resources and ecological habitats such as forest or wetlands.

This category focuses on the project and asset level decisions that flow on from good strategic land use planning in relation to infrastructure.

The following four credits apply to the Land category:

Lan-1 Previous land use
Lan-2 Conservation of on-site resources
Lan-3 Contamination and remediation
Lan-4 Flooding design

Issues relating to groundwater, surface water, ecology, archaeology/heritage, pollution prevention, waste, materials use, transport, and other issues, context and integration, although related to land use, are considered in other categories of the tool.
Lan-1 – Land use value

**Aim**

To reward the equitable management of livelihood, cultural access and recreational values of land used for infrastructure development

**Criteria**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Resettlement Action/Management Plan is developed and implemented AND The plan has been developed based on meaningful consultation AND Includes, equitable compensation for impacts due to:  - Involuntary displacement of people and business - Loss of community space or public amenity - Restriction to cultural or community access rights</td>
<td>The requirements for Level 1 are achieved. AND Implementation and monitoring of the action plan is undertaken</td>
<td>The requirements for Level 2 are achieved. AND Monitoring demonstrates overall enhancement of land value has been achieved</td>
<td></td>
</tr>
</tbody>
</table>

**Evidence**

- Resettlement Action Plan
- Community and Cultural Access Rights Plan
- Environmental and Social Management System

**Evidence**

- Evidence as for Level 1 AND Ex post review of plan implementation by bank institutions such as the World Bank, or independent third party verification
- Evidence as for Level 2 AND Independent third party verification

**Additional Guidance**

Infrastructure projects can impact on the previous land users positively or negatively. Where it cannot be avoided, the involuntary resettlement of people and/or restrictions on legal land access rights for livelihood, cultural or recreational purposes can result in long-term hardship to individuals and communities, if not properly managed.

**Level 1**

A resettlement action plan must be developed based on consultation with the local community and key stakeholders. The plan should also detail opportunities to avoid and/or reduce impacts.

Consultation may be completed through a community reference group.

Where a project impacts on land, assets, or access to assets become significantly adverse at any stage of the project, the client must apply the requirements of the IFC Performance Standard, even where no land acquisition or land use restriction is involved

- To avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs.
- To avoid forced eviction.
- To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by providing compensation for loss of...
assets at replacement cost and ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected.

- To improve, or restore, the livelihoods and standards of living of displaced persons
- To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites


Local legislative requirements should also be met in addition to IFC’s objectives. Projects may use evidence from meeting these requirements to demonstrate compliance with the credit criteria.

**Level 2**

The resettlement action/management plan must be actively monitored and improvement measures are implemented.

Monitoring should include 6 monthly reviews including feedback from the community and/or key stakeholders.

The management plan must:

- Be Informed by participation in key phases,
- Have broad scale community acceptance

Participation should focus on the community who are directly impacted by the project.

Community acceptance should be demonstrated through survey or community interviews. Social media platforms can be used to collect wide scale community feedback.

**Level 3**

Monitoring on the resettlement action/management plan demonstrates that an overall enhancement of land value has been achieved.

Check online ISCA Guidance Repository for latest approved references.
Lan-2 –Conservation of on-site resources

Aim
To reward conservation of soil resources.

Criteria

<table>
<thead>
<tr>
<th>Benchmark – Developed Countries</th>
<th>Evidence – All Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation of topsoil and subsoil has been considered.</td>
<td>Design and management reports.</td>
</tr>
</tbody>
</table>

**Level 1**

- The requirements for Level 1 are achieved.
- AND
- All subsoil and topsoil impacted by the project is separated and protected from degradation, erosion or mixing with fill or waste;
- AND
- 95% of all topsoil (by volume) retains its productivity and is beneficially re-used on or nearby to the project.

**Level 2**

- The requirements for Level 2 are achieved.
- AND
- Opportunities to improve topsoil productivity of previously disturbed areas have been identified and incorporated into the project.

**Level 3**

- Evidence as for Level 2.

Additional Guidance

Topsoil is defined as the surface layer of soil containing partly decomposed organic debris, which is usually high in nutrients, contains many seeds and is rich in the fungus, mycorrhizae. Subsoil is the layer of soil between the topsoil and bedrock.

Guidance on good practice with regard to soils is available from DEFRA (UK) 2009.

Soil Conservation

To achieve Level 2 and Level 3, correct separation, handling and storage of topsoil and subsoil must be demonstrated. Evidence could be the existence of instructions on soil handling, a soil handling and management strategy, or minutes of site meetings etc. referring to handling and storage.

Productivity and Beneficial Re-use

To achieve Level 2 and Level 3 it must be demonstrated that the integrity of the site’s topsoil was not compromised during construction works and that topsoil remains productive at completion of construction. For developed countries it needs to be demonstrated that 95% of topsoil retains its productivity and it is being re-used on site or nearby. To remain productive, the topsoil must not be covered by permanent hard surfaces. This can be demonstrated through reports and as built drawings that:

- quantify the amount of topsoil pre-existing on the site,
- quantify the amount of topsoil covered by hard surfaces as a result of the project,
- describe the scope and extent of the construction works, and how existing topsoil is affected,
- where topsoil is present and affected, describe how the integrity of the site’s topsoil is protected throughout construction works,
• confirm that any topsoil permanently exported from the site is beneficially re-used nearby to the project or asset, and
• describe the ‘before’ and ‘after’ conditions that account for all topsoil on the site, and clearly showing the percentage of site topsoil that will be covered by hard surfaces as a consequence of the design, and the percentage of the site’s topsoil will remain productive.

Beneficial re-use includes leaving the soil where it is and moving it to another location where it is used for landscaping. What represents ‘nearby’ must be judged in the context of the project and its location. This might mean within 15km in a built-up area, but up to 100km if the site generating the surplus topsoil is in a remote area. The project should provide justification for re-use nearby.

**Developing Countries**

Developing Countries do not need to demonstrate compliance with the 95% requirement for topsoil. Instead, they must demonstrate that they have investigated and implemented all feasible opportunities for topsoil reuse and they have beneficially reused

on or nearby to the project the maximum volume of topsoil that retains its productivity. The following initiatives can be investigated as part of the opportunities analysis:

- Protection and stabilisation of topsoil after vegetation clearance
- On site separation of topsoil
- Testing of topsoil
- Rehabilitation to create productive topsoil

**Small Projects**

The 95% productivity requirement is deemed to be automatically be satisfied by meeting the other Level 2 requirement.

**Productivity Improvement**

For Level 3, the evidence above must demonstrate that overall topsoil productivity on the project site has been improved.

Check online ISCA Guidance Repository for latest approved references.
## Lan-3 Contamination and remediation

### Aim
To reward projects that assess contamination and perform sustainable remediation.

### Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site contamination and risk assessment has taken place according to national and / or international best practice standards for risk informed decision making regarding contaminated sites best practices. AND Remediation options are identified and selected using a sustainability hierarchy.</td>
<td>The requirements for Level 1 are achieved. AND An independent contaminated sites auditor has reviewed and approved the Remediation Action Plan.</td>
<td>The requirements for Level 2 are achieved. AND The effectiveness and durability of the remedial solution, and maintenance and monitoring, have been considered over the lifetime of the infrastructure and beyond. AND No ongoing remedial action is required during operation.</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Guidance

Land is considered contaminated when it contains hazardous materials or oil concentrations above background or naturally occurring levels, according to IFC’s Environmental, Health and Safety Guidelines (1.8 Contaminated Land). Note that contamination addresses the condition of land or water and does not address the presence of hazardous substances in buildings or structures which is dealt with separately. For clarity, contamination includes asbestos but does not include acid sulphate soils.

### Site Assessment

Contamination reports must demonstrate how national and / or international best practice standards have been followed.

International standards and guidelines can be used for this purpose:

- ASTM E1527 – 13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process
- ASTM E1903 – 11, Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process
- IFC’s Environmental, Health and Safety Guidelines (1.8 Contaminated Land)
- ISO standards for analysis and sampling (such as 13530, 10381 series 1-4, 14507, 1689)
- ISO 19204:2017 Soil quality -- Procedure for site-specific ecological risk assessment of soil contamination (soil quality TRIAD approach)

Other national or international standards can also be accepted, these should be issued to ISCA for approval prior to use.

### Sustainability Appraisal

The sustainability hierarchy for remediation is:

1. If practicable, on-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level.
2. Off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site.

3. Consolidation and isolation of the soil on site by containment with a properly designed barrier.

4. Removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material.

5. Where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

If an option less favourable than the first option is selected, then justification for not selecting options higher on the hierarchy must be provided. A remediation plan or similar is needed to demonstrate that this hierarchy was applied. A remediation plan is any plan which provides direction on the management of contamination.

In cases where no readily available or economically feasible method is available for remediation, it may be possible to adopt appropriate regulatory controls or develop other forms of remediation.

Independent Auditor

For Level 2, the independent sustainability professional needs to have qualifications in contamination assessment field and at least 10 years’ relevant experience. They must be independent and have no vested interest in the project. The role could be fulfilled by a combination of people where it can be demonstrated that their combined skills and experience address the credit requirements.

Remedial Solution

For Level 3, evidence must be available regarding the longevity of the remedial solution and normal maintenance requirements. The forecast useful life of the asset should not be greater than the lifetime of the remedial solution. Long-term monitoring may be required to ensure the continued effectiveness of some solutions, including natural attenuation, permeable reactive barriers, slurry walls, ongoing process-based treatments for groundwater, etc. Monitoring arrangements will depend on the type of remediation method chosen and its projected lifetime. Where monitoring is necessary, there should also be contingency plans in case monitoring data should demonstrate any fault or deterioration in the remedial solution.

In addition, to achieve Level 3, the site should not require ongoing remediation during operation.

Suitably Qualified Professional

The site assessment and remediation appraisal should be managed, reviewed or audited by a suitably qualified professional. For the purposes of this credit, a suitably qualified professional should have a relevant qualification and at least five years’ experience in contaminated land management.

Check online ISCA Guidance Repository for latest approved references.
Lan-4 Flooding design

**Aim**

To reward designing for flood events.

**Criteria**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>The run-off, flood risk, and potential increased flood risk elsewhere as a result of the project have all been assessed over their expected working life in line with the requirements of recognised guidelines and appropriate flood resilience measures have been included in the design so that there is <strong>no increase</strong> in flood risk.</td>
<td>The run-off, flood risk, and potential increased flood risk elsewhere as a result of the project have all been assessed over their expected working life, in line with the requirements of recognised guidelines and appropriate flood resilience measures have been included in the design so that there is a <strong>significant decrease</strong> in flood risk.</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Evidence</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood risk assessment, design report, as-built drawings, asset management plan.</td>
<td>Evidence as for Level 1.</td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Guidance**

Any development, whether or not it is situated in a floodplain, can contribute to increased flood risk. Creating additional sealed surfaces on previously open ground will increase run-off, which, if fed into existing rivers or sewerage systems, adds to the existing load. Climate change projections have identified increased rainfall including incidences of extremely heavy rains, the type of events that cause flooding as a result of drainage systems not being able to cope with the sudden volume of water run-off.

Note that even refurbishment projects may create additional sealed surfaces and a run-off assessment should be carried out in any case, to ensure that run-off does not exceed the capacity of existing systems.

**Flood Risk Assessment**

The flood risk assessment should be undertaken by a qualified professional with at least 5 years’ experience and should follow national and / or international flood management principles and guidelines. See ISCA Guidance Repository under International References of this credit for ISCA approved guidelines for use in this credit.

**Level 1**

It must be demonstrated that there is no increased flood risk as a result of the project. The project should define “no increase” this based on the standards and guidelines used.

Where upstream and/or downstream of the infrastructure site is an open water body (e.g. ocean or bay), then flooding risk is not relevant to that open water body and can be excluded from consideration for this credit.

**Level 2**

A significant reduction in flood risk must be demonstrated. The project should define “significant reduction” based on the standards and guidelines used.

Any discharges to drainage systems should be designed and approved in accordance with country specific guidance and regulations.
Where it can be clearly demonstrated that a reduction in flooding is not desirable e.g. where an ecological community requires flooding as part of its natural ecological processes, then Level 2 may still be achieved.

Climate change predictions must be considered in applying this credit.

Evidence could include assessment or calculations of run-off or, for larger projects, consultants’ reports and/or evidence of consultations with appropriate regulators. On certain types of projects, especially small ones – for example a small bridge over a river or canal, or strengthening a river or canal bank – a qualitative assessment may be sufficient evidence. For example, the assessment may have been made at and recorded in the minutes of a design meeting.

Check online ISCA Guidance Repository for latest approved references.
WASTE

World cities generate about 1.3 billion tonnes of solid waste per year. This volume is expected to increase to 2.2 billion tonnes by 2025. Waste generation rates will more than double over the next twenty years in lower income countries (Hoornweg, D. & Bhada-Tata, P. What a Waste: A Global Review of Solid Waste Management, World Bank, 2012). Rubbish is being generated faster than other environmental pollutants, including greenhouse gases. That level of waste carries serious consequences – physical and fiscal – for cities around the world.

Waste, according to IFC’s Environmental, Health, and Safety (EHS) Guidelines, Waste Management, is any solid, liquid, or contained gaseous material that is being discarded by disposal, recycling, burning or incineration. It can be a by-product of a manufacturing process or an obsolete commercial product that can no longer be used for intended purpose and requires disposal. Solid waste includes inert construction / demolition materials; refuse, such as metal scrap and empty containers (except those previously used to contain hazardous materials which should, in principle, be managed as a hazardous waste), discarded and buried temporary materials; and residual waste from industrial operations, such as boiler slag, clinker, and fly ash.

Waste and its management has been highlighted as one of the environmental issues of major concern in maintaining the quality of the Earth’s environment in the UN ‘Agenda 21’ plan (United Nations 1992).

Agenda 21 also highlighted that “Unsustainable patterns of production and consumption are increasing the quantities and variety of environmentally persistent wastes at unprecedented rates”. Developed countries increasingly export waste (both legally and illegally) to developing countries.

Agenda 21 goes on to say “The exhaustion of traditional disposal sites, stricter environmental controls governing waste disposal and increasing quantities of more persistent wastes, particularly in industrialised countries, have all contributed to a rapid increase in the cost of waste disposal services. As the economics of waste disposal services change, waste recycling and resource recovery are becoming increasingly cost-effective.”

A wide variety of waste policies and laws at different government levels has resulted in complexity and contributed to increased costs and barriers. In some cases, it has even led to perverse or unintended consequences, such as reducing costs by moving waste to lower level treatment facilities.

Deployment of existing and innovative technologies for better waste avoidance, reprocessing and recycling can provide benefits to business, industry and consumers such as saving money, water and energy and avoiding greenhouse gas emissions and pollution. Re-use of resources can also conserve virgin and finite resources and generate new opportunities and jobs.

According to the UN Environment, there is a growing understanding among local authorities of the negative impacts that wastes can have on the local environment (air, water, land, human health etc.) and also on climate change. It is also being recognized that valuable habitats and biodiversity are being threatened by improper management of waste. Local authorities also realize that the increasing complexity, costs and coordination for waste management require multi-stakeholder involvement at every stage of the waste management. However, waste management still remains one of the costliest public services as conventional waste management systems are not well suited to deal with increased waste generation rates and new and special waste streams. In most cases, the revenue from waste management activities is not large enough to compensate for the expenditures.

The infrastructure industry has an awareness of the ‘waste hierarchy’ (reduce, re-use, recycle) and in most infrastructure projects, there is potentially extensive direct and indirect engagement by project personnel in waste management practices.
Potential impacts of waste management include:

- pollution and litter,
- inefficient use of resources,
- energy use in transport and disposal, and
- if putrescible wastes are landfilled, the generation of methane, a powerful greenhouse gas.

According to IFC, facilities that generate and store wastes should practice the following:

- Establishing waste management priorities at the outset of activities based on an understanding of potential Environmental, Health, and Safety (EHS) risks and impacts and considering waste generation and its consequences
- Establishing a waste management hierarchy that considers prevention, reduction, reuse, recovery, recycling, removal and finally disposal of wastes.
- Avoiding or minimizing the generation of waste materials, as far as practicable
- Where waste generation cannot be avoided but has been minimized, recovering and reusing waste
- Where waste cannot be recovered or reused, treating, destroying, and disposing of it in an environmentally sound manner

This category assesses the level and effectiveness of waste management practices towards achieving the goal of zero waste to landfill over the lifecycle of a given piece of infrastructure through recycling, re-use, design optimisation and contract management.

The following three credits apply to the Waste category:

**Was-1** Waste management

**Was-2** Diversion from landfill

**Was-3** Deconstruction/ Disassembly/ Adaptability

There are multiple links to other categories, in particular:

- There is a strong link to the Materials category since efforts to avoid or minimise waste generation often contribute to improved resource efficiency. The focus of this category is therefore proper management of waste, diversion from landfill and deconstruction/disassembly/adaptation of infrastructure.
- Waste improperly disposed of may impact on the Community health, wellbeing and safety, on Ecology and on Water.
- Putrescible wastes disposed of to landfill generate greenhouse gas emissions (Energy and Carbon category).
Was-1 Waste management

Aim
To reward sustainable waste management plans and practices.

Criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark</td>
<td>Predictions for waste quantities and types have been developed for construction and operation. AND Measures to minimise waste during construction and operation have been identified and implemented. AND Monitoring of all wastes is undertaken during construction and operation.</td>
<td>The requirements for Level 1 are achieved. AND Waste monitoring and management has been managed, reviewed or audited by an independent suitably qualified professional. AND Waste handling and disposal/recycling all the way to final destination has been audited at appropriate intervals.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Design reports Management plans. Waste monitoring records and reports.</td>
<td>Evidence as for Level 1. Review/audit reports.</td>
</tr>
</tbody>
</table>

Additional Guidance
This credit is intended to cover all wastes including those covered under Was-2. The scope of wastes is as per the below definition:

Waste, according to IFC’s Environmental, Health, and Safety (EHS) Guidelines, Waste Management, is any solid, liquid, or contained gaseous material that is being discarded by disposal, recycling, burning or incineration

Management Measures
A Waste Management Plan (or similar) must demonstrate that the waste hierarchy was applied:

1. Avoid
2. Reduce
3. Reuse
4. Recycle
5. Disposal

If an option less favourable than the first option is selected, then justification for not selecting options higher on the hierarchy must be provided.

Monitoring
Monitoring of waste should include the waste types generated, quantities (volumes or weight is acceptable as long as it is consistent throughout the credit submission) and destinations during construction and operation. Summaries of (a) spoil, (b) inert and non-hazardous, and (c) office waste groups should be provided. Evidence for Level 1 monitoring could be a spreadsheet detailing the volumes or weight and categories of waste produced. The monitoring would need to be regular (e.g. monthly) throughout the relevant rating phases as well as showing totals for the whole rating period.

A plan to monitor in construction and operation is all that is required for the design phase.
Waste Monitoring and Management

For Level 2, waste monitoring and management must be managed, reviewed or audited by an independent suitably qualified professional. If review or audit is undertaken, it should be at least annually for construction and operation or at least once for durations less than one year. The review or audit should cover both systems and data i.e. the systems used to manage waste and the data recording and reporting. The scope of the waste review/audit should include an objective assessment of the accuracy and completeness of reported waste information with the aim to provide confidence that the reported information represent a faithful, true, and fair account of waste management practices and performance.

Preparation or review of monitoring and management plan(s) is all that is required for the design phase.


Independent Suitably Qualified Professional

A suitably qualified professional for the purposes of this credit means someone with at least five years’ waste management experience, or equivalent. To demonstrate independency, the professional should not be involved in the design of the project and should be engaged directly by the client.

Waste Auditing to Final Destination

Auditing to final destination must be undertaken at least 6 monthly for construction and annually for operation. Final destination means at least to a waste facility where the waste is transformed into another product or material or into landfill. Physical sorting of waste is not considered a final destination.

The audit should include a physical/visual verification of waste destinations. For final destinations that are quite distant (>250 km) from the project/asset site, auditing through examination of waste sub-contractor records, desk top research, phone interviews, or similar is sufficient. The audit need only focus on the significant waste streams and each audit may cover particular significant waste stream(s) as long as the full set is covered over the rating period. ‘Significant’ waste streams are to be justified taking into account the volume or weight and nature of the wastes.

A plan to audit in construction and operation is all that is required for the design phase.

Check online ISCA Guidance Repository for latest approved references.
DEVELOPED COUNTRIES

Was-2 Diversion from landfill

Aim

To reward diversion of spoil, inert, non-hazardous and office waste from landfill.

Criteria

<table>
<thead>
<tr>
<th>Benchmark – Developed Countries</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All of the following targets for landfill diversion have been achieved or bettered: 70 to &lt;80% by volume of spoil AND 25 to &lt;50% by volume of inert and non-hazardous waste AND 25 to &lt;40% by volume of office waste.</td>
<td>All of the following targets for landfill diversion have been achieved or bettered: 80 to &lt;100% by volume of spoil AND 50 to 90% by volume of inert and non-hazardous waste AND 40 to 60% by volume of office waste.</td>
<td>All of the following targets for landfill diversion have been achieved or bettered: 100% by volume of spoil AND &gt;90% by volume of inert and non-hazardous waste AND &gt;60% by volume of office waste material.</td>
</tr>
<tr>
<td>Evidence</td>
<td>Waste monitoring records and reports.</td>
<td>Evidence as for Level 1.</td>
<td>Evidence as for Level 2.</td>
</tr>
</tbody>
</table>

Additional Guidance

This credit does not apply to the Design rating.

Definitions

- **Spoil**: Uncontaminated excavated clay, gravel, sand, soil or rock that is not mixed with any other type of waste and resulting from construction and demolition activities. Note that acid sulphate soils are not included in this definition.
- **Inert and non-hazardous waste**: bricks, concrete, paper, plastics, glass, metal and timber; asphalt; used, rejected or unwanted tyres; pallets; metals; plastics; being material resulting from construction and demolition activities.
- **Office waste**: Office and packaging waste - paper, cardboard, plastics, and food waste that is generated from ‘office activities’.
- **Hazardous waste**: Waste which has any of the following characteristics: Explosive, Flammable Liquids/Solids, Poisonous, Toxic, Ecotoxic, Infectious Substances. Hazardous wastes including asbestos and contaminated soil. The “European Waste Catalogue and Hazardous Waste list” and the US EPA’s Hazardous Waste list include classification of waste.

Re-use of spoil off site may include use for landfill capping if the material is genuinely inert and is used as capping material.

It is acceptable to use weight instead of volumes as long as it is consistent throughout the credit submission.

IFC’s Environmental, Health, and Safety (EHS) Guidelines, Waste Management, provides guidelines on waste diversion from landfill.

Check online ISCA Guidance Repository for latest approved references.
DEVELOPING COUNTRIES

Was-2 Diversion from landfill

Aim

To reward diversion of spoil, inert, non-hazardous and office waste from landfill.

Criteria

<table>
<thead>
<tr>
<th>Benchmark - Developing Countries</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the following targets for landfill diversion have been achieved or bettered: 70 to &lt;80% by volume of spoil AND 25 to &lt;50% by volume of inert and non-hazardous waste.</td>
<td>All of the following targets for landfill diversion have been achieved or bettered: 80 to &lt;90% by volume of spoil AND 50 to 80% by volume of inert and non-hazardous waste.</td>
<td>All of the following targets for landfill diversion have been achieved or bettered: 90-100% by volume of spoil AND &gt;80% by volume of inert and non-hazardous waste AND 25 to &lt;40% by volume of office waste.</td>
<td></td>
</tr>
<tr>
<td>Waste monitoring records and reports.</td>
<td>Evidence as for Level 1.</td>
<td>Evidence as for Level 2.</td>
<td></td>
</tr>
</tbody>
</table>

Additional Guidance

Developing Countries have the option to use this credit or Credit Was-2 for Developed Countries.

This credit does not apply to the Design rating.

Definitions

- **Spoil**: Uncontaminated excavated clay, gravel, sand, soil or rock that is not mixed with any other type of waste and resulting from construction and demolition activities. Note that acid sulphate soils are not included in this definition.
- **Inert and non-hazardous waste**: bricks, concrete, paper, plastics, glass, metal and timber; asphalt; used, rejected or unwanted tyres; pallets; metals; plastics; being material resulting from construction and demolition activities.
- **Office waste**: Office and packaging waste - paper, cardboard, plastics, and food waste that is generated from ‘office activities’.
- **Hazardous waste**: Waste which has any of the following characteristics: Explosive, Flammable Liquids/Solids, Poisonous, Toxic, Ecotoxic, Infectious Substances. Hazardous wastes including asbestos and contaminated soil. The “European Waste Catalogue and Hazardous Waste list” and the US EPA’s Hazardous Waste list include classification of waste.

Re-use of spoil off site may include use for landfill capping if the material is genuinely inert and is used as capping material.

It is acceptable to use weight instead of volumes as long as it is consistent throughout the credit submission.

IFC’s Environmental, Health, and Safety (EHS) Guidelines, Waste Management, provides guidelines on waste diversion from landfill.

Check online ISCA Guidance Repository for latest approved references.
Was-3 Deconstruction / Disassembly / Adaptability

Aim

To reward design and planning for deconstruction disassembly and adaptability of infrastructure in the future.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 1 to 3 on sliding scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>A deconstruction / disassembly / adaptability plan is developed based on good practice.</td>
<td>The requirements for Level 1 are achieved. AND The deconstruction plan is reviewed and updated. Reviews should consider changes to technology and infrastructure planning. AND 0 to 50% by value of components or pre-fabricated units used can be easily separated on disassembly/ deconstruction into material types suitable for recycling or reuse. For every increment of deconstructability up to 50% for Level 3, fractions of Levels may be achieved on a sliding scale.</td>
<td></td>
</tr>
<tr>
<td>Deconstruction plan. OR Disassembly plan. OR Adaptability plan.</td>
<td>Deconstruction plan showing reviews. Design and/or construction reports.</td>
<td></td>
</tr>
</tbody>
</table>

Evidence

Deconstruction plan.
OR Disassembly plan.
OR Adaptability plan.

Additional Guidance

Design for Deconstruction (DfD) is a movement with the goal to responsibly manage end-of-life building materials to minimize consumption of raw materials. It is about designing in such a way that materials and products can be economically recovered and reused at the time of deconstruction. In contrast to the conventional linear model of extraction, use, and landfilling, DfD envisions a closed cycle of use and reuse. The ultimate goal of DfD is to responsibly manage end-of-life infrastructure materials to minimize consumption of raw materials. By capturing materials removed during infrastructure upgrades or demolition and finding ways to reuse them in another construction project or recycle them into a new product, the overall environmental impact of end-of-life infrastructure materials can be reduced (US EPA).

DfD is often thought of only as it applies to infrastructure at the end of its life. But DfD can be thought of as an overall term encompassing Design for Adaptation, -Disassembly, -Reuse, -Recycling, -Reparability, -Product recovery, and -End-of-life. In fact, some of the greatest benefits of DfD are during the infrastructure lifetime, or actually to extend its useful life. For example, it is common to widen a road by modifying the shoulder and verges before the end of its life to expand capacity. If the road is designed with this in mind, the adaptation process can be quicker, cheaper, use less materials and produce less waste.

By making infrastructure components easier and faster to remove, it is easier to adapt or change the infrastructure to meet evolving functions over its lifetime. This reduces the cost of upgrades and extends infrastructure life by
making upgrades economic. Extending the useful life of an infrastructure is in many cases the most sustainable outcome.

One major challenge for infrastructure DfD is the dominance of “wet” assembly, which is systems constructed for, and at, a specific geographic site. Literal “wet” construction such as cast-in-place concrete does not readily lend itself to separation for reuse.

Deconstruction Good Practice

For the deconstruction plan there is some guidance available in the literature (Crowther, 2000b; Ng, 2009) although much of this relates to products and buildings. Good practice must consider the following ten key principles of DfD (Guy, 2006):

1. **Document materials and methods for deconstruction.** As-built drawings, labelling of connections and materials, and a “deconstruction plan” in the specifications.

2. **Select materials using the precautionary principle.** Materials that are chosen with consideration for future impacts and that have high quality will retain value and/or be more feasible for reuse and recycling.

3. **Design connections that are accessible.** Visually, physically, and ergonomically accessible connections will increase efficiency and avoid requirements for expensive equipment or extensive environmental health and safety protections for workers.

4. **Minimize or eliminate chemical connections.** Binders, sealers and glues on, or in materials, make them difficult to separate and recycle, and increase the potential for negative human and ecological health impacts from their use.

5. **Use bolted, screwed and nailed connections.** Using standard and limited palettes of connectors will decrease tool needs, and time and effort to switch between them.

6. **Separate mechanical, electrical and plumbing (MEP) systems.** Disentangling MEP systems from the assemblies that host them makes it easier to separate components and materials for repair, replacement, reuse and recycling.

7. **Design to the worker and labour of separation.** Human-scale components or conversely attuning to ease of removal by standard mechanical equipment will decrease labour intensity and increase the ability to incorporate a variety of skill levels.

8. **Simplicity of structure and form.** Simple open-span structural systems, simple forms, and standard dimensional grids will allow for ease of construction and deconstruction in increments.

9. **Interchangeability.** Using materials and systems that exhibit principles of modularity, independence, and standardization will facilitate reuse.

10. **Safe deconstruction.** Allowing for movement and safety of workers, equipment and site access, and ease of materials flow will make upgrade and disassembly more economical and reduce risk.

Where an aspect of good practice above is not applicable to the infrastructure, suitable justification must be provided.

Development of a deconstruction plan should involve the following tasks (Davies, 2008; Guy 2006):

1. **Statement of strategy for Design for Deconstruction (DfD) relating to the infrastructure**
   - Demonstrate the strategy behind the designed re-usable elements and describe best practice to ensure they are handled in a way which preserves maximum re-usability.

2. **List infrastructure elements**
   - Provide an inventory of all materials and components used in the project together with all full specifications and all warranties, including details of manufacturers.
- Describe the design life and/or service life of materials and components.
- Identify best options for re-use, reclamation, recycling and waste to energy for all infrastructure elements.

3. Provide instructions on how to deconstruct elements
- Provide up-to-date location plans for identifying information on how to deconstruct infrastructure.
- Where necessary add additional information to the “as built” set of drawings to demonstrate the optimum technique for removal of specific elements.
- Describe the equipment required to dismantle the infrastructure, the sequential processes involved and the implications for health and safety as part of the CDM requirements.
- Ensure that the plan advises the future demolition contractor on the best means of categorising, recording and storing dismantled elements.

4. Distribution of DfD Plan
- Revise the plan as necessary and re-issue to all parties at the handover stage, so that there is maximum awareness of the DfD requirements for the future, including owner, designer and builder.
- Place copies of the revised Deconstruction Plan with the legal documents, the Health and Safety file and the maintenance file.

A model Deconstruction Specification is provided in Guy (2006). The deconstruction plan should include:

- Material identification: Indicate anticipated types and quantities of materials to be salvaged, recycled, and disposed of. Indicate quantities by weight or volume, but use same units of measure throughout.
- Procedure: Describe deconstruction methodology, sequencing, and materials handling and removal procedures. Include the anticipated final destination of each material.

Updating
For Level 2 and Level 3, the deconstruction plan should be updated at least once during the rating phase period (i.e. design, construction or operation phase).

If an adaptability plan is developed in Level 1, then Levels above Level 1 cannot be achieved.

Disassembly/Deconstruction
Examples of material types that may be suitable for disassembly include bricks, blocks, stone and concrete, treated and untreated timber, glass, PVC, different types of plastic, metal, paper and cardboard, and components (for example, sinks, toilets, radiators). The value of materials should be based on the purchase price. Evidence needs to substantiate the percentage being claimed.

Developing Countries
Level 2 and 3 do not apply and full points can be achieved for Level 1.

Small Projects
Level 2 and 3 do not apply and full points can be achieved for Level 1.

Check online ISCA Guidance Repository for latest approved references.
Ecology
ECOLOGY

Globally, it is widely recognised that ecosystems are being degraded. In 2005 the Millennium Ecosystem Assessment (MEA, 2005) found that 15 of the 24 ecosystem services it evaluated were being used unsustainably or were degraded. The Global Biodiversity Outlook (CBD, 2010) describes how these services are threatened by declines in biodiversity due to habitat loss and degradation; climate change; excessive nutrient loads and other forms of pollution; over-exploitation of resources and invasive alien species. Although there has been some slowing of the rate of loss of important habitats such as mangroves and tropical forests, endangered species are on average moving closer to extinction.

Continued urban development and increased demand for resources – including land, water, minerals, etc. – fragments habitats and reduces their quality and quantity and reduces their overall ability to function as systems. Climate change and the pollution of water, air and soils further impact on biodiversity, causing species to become extinct at accelerating rates, often unnoticed at the local and regional level. Ecosystems provide important 'ecosystem services', for example, water purification, soil formation, absorption of chemicals, nutrient cycling, and climate stability. Many ecosystem services directly underpin important industries, such as agriculture and fisheries. Ecosystems also provide many important social and cultural services. Examples include the kangaroo as an iconic species, wildlife spotting in recreation, the role of natural history in research and education, the benefits of experiencing nature and the knowledge that nature exists.

Biodiversity is a key regulator of ecosystem functioning (Tilman et al., 1997; Hooper et al., 2005) and of ecosystem services.

The Convention on Biological Diversity (UN 1992) is an international agreement for the conservation and sustainable use of biological diversity, and the fair and equitable sharing of benefits arising from the use of genetic resources.

Many factors associated with infrastructure development and operation, for example land clearing, the pollution of soil, air, and water with chemicals, nutrients and carbon as well as noise, dust and light spill from construction activities, can significantly affect ecosystem functioning. Infrastructure activities that contribute to functioning ecosystems include those that focus on reducing habitat loss and fragmentation (e.g. maintenance of wildlife corridors) and enhancing connectivity within ecosystems (e.g. "fishways" and fish ladders on bridges and dams).

A focus on the functioning of ecosystems requires a systems approach – that is, all elements of ecosystems (soil, water, air, biomass, wildlife) and their interconnections need to be considered. These interconnecting functions depend on a range of environmental factors, for example soil moisture, soil temperature, and the presence of animals. At the ecosystem scale, these factors are in turn affected by habitat availability and connectivity (e.g. wildlife corridors, minimum reserve areas), or bio-passage in aquatic, estuarine and marine systems (e.g. timely environmental flows, maintenance of fish passage). It is these ecosystem-scale factors, through the mechanism of habitat degradation and loss, that infrastructure directly interacts with, for example when clearing of native vegetation is required to make way for an airport. This theme focuses primarily on habitat degradation and loss as the key infrastructure impacts as it is here where the causes, solutions and opportunities reside.

The intent of this theme/category is not just to minimise or mitigate the negative impacts on ecosystems through all stages of the project lifecycle, but also to foster infrastructure decisions that restore (enhance) ecosystem functioning. Significant opportunities exist to design strategies and technologies that consider ecosystem impacts and avenues for ecosystem enhancement during the design, construction and operation phases of the infrastructure lifecycle. Examples include returning water to floodplains, rivers and wetlands; preventing or stabilising soil erosion; and preventing pollution (e.g. by removing
sewage from wastewater before discharging it). However, the effectiveness of these strategies also relies on their implementation during construction and operation, as well as the capacity for infrastructure to be responsive and adaptive so that threats to ecosystem functioning can be minimised throughout. Good baseline data and ongoing monitoring are critical to this adaptive capacity.

Infrastructure may impact on the functioning of ecosystems to varying degrees and across the different lifecycle stages of assets. The credits in this category recognise that the sustainability performance of infrastructure in terms of ecosystem functioning will depend significantly on existing levels of habitat fragmentation and native vegetation (e.g., wetlands, temperate rainforests). This category focuses on maintaining or enhancing the ecological value of the infrastructure site, maintaining or enhancing the biodiversity present, and maintaining or enhancing the degree of habitat connectivity. The concepts of maintenance and enhancement equate to ‘no net loss’ and ‘net gain’ approaches. ‘No net loss’ can be defined as “the point where biodiversity gains from targeted conservation activities match the losses of biodiversity due to the impacts of a specific development project, so that there is no net reduction overall in the type, amount and condition (or quality) of biodiversity over space and time” (Business and Biodiversity Offsets Programme 2012).

The following two credits apply to the Ecology category:

**Eco-1**  Ecological value

**Eco-2**  Habitat connectivity

Vegetation clearing may be relevant to both this category and the Energy & Carbon category in relation to estimation of carbon footprints.

The Land Management category broadly covers brownfield and greenfield land use and conservation of soils, whereas this category focuses on the ecosystems themselves.

The Heritage category addresses indigenous and non-indigenous heritage whereas natural heritage is addressed in this category.

The Urban & Landscape Design category incorporates broad consideration of landscape features but from primarily from an aesthetic and design viewpoint rather than an ecological viewpoint which is the focus of this category.
Eco-1  Ecological value

Aim
To reward maintenance or enhancement of ecological value.

Criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>An ecological assessment (EcA) has been developed and the ecological value of the infrastructure site is maintained.</td>
<td>The ecological value of infrastructure site is enhanced by 0 to 20%. Fractions of Levels may be achieved on a sliding scale up to 20% for Level 3.</td>
<td></td>
</tr>
<tr>
<td>Benchmark – Developed Countries</td>
<td>Evidence as for Level 1</td>
<td></td>
</tr>
<tr>
<td>Evidence – Developed Countries</td>
<td>Evidence as for Level 1</td>
<td></td>
</tr>
<tr>
<td>Ecological Assessment</td>
<td>Evidence as for Level 1</td>
<td></td>
</tr>
<tr>
<td>Drawings showing area impacted</td>
<td>Evidence as for Level 1</td>
<td></td>
</tr>
<tr>
<td>Ecological Management Plan</td>
<td>Evidence as for Level 1</td>
<td></td>
</tr>
</tbody>
</table>

Additional guidance – Developed Countries

This credit includes:

- A conditional requirement that must be satisfied if there is any ecologically sensitive habitat present, and
- An ecological value assessment using an Ecological Impact Assessment

Ecologically Sensitive Habitats

This is a conditional requirement for achievement of any points under this credit:

If the project, including land used for temporary works, includes, uses or potentially may impact, habitat that has been identified as ecologically sensitive, then an ecological management plan (or similar) must be developed and implemented that prioritises minimising ecological impacts, and is managed, reviewed or audited by a suitably qualified professional.

Ecologically sensitive habitat includes:

- Prime agricultural land.
- Land containing old-growth forest.
- Land containing threatened species
- Land within 100 metres of key habitats for nationally and internationally listed threatened species or migratory species.
- Coastal areas.

Definitions

- **Prime agricultural land**: land recognised for its high productivity in agricultural production, based on the importance of specific land requirements for high value crops. The designation of prime agricultural land is done by referencing the appropriate state or local land use planning or environmental guidelines.
- **Old-growth forest**: is a forest that is ecologically mature and has been subjected to negligible unnatural disturbance such as logging, clearing or creation of roads. The definition focuses on forest in which the upper
stratum or over-storey is in the late-mature to over-mature growth phases.

- **Threatened species:** Threatened species are those listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). Threatened species are those listed in the IUCN Red List of Threatened species, or local lists.

- **Wetlands:** A wetland is deemed to be a ‘high value wetland’ if it is deemed significant under a state or national register; or if it is a listed wetland under The Ramsar Convention on Wetlands.

- **Coastal area:** A zone where the land meets the sea or some other large expanse of water.

The term ‘land’ in this credit also applies broadly to infrastructure built on or over marine, estuarine or freshwater habitats.

**Ecological Value**

This is a scaled credit. The assessment of ecological value under this credit compares the value before and after the infrastructure development (construction). For Level 1 it is necessary to demonstrate that the ecological value is (or will be) maintained. Where an enhancement is achieved, fractions of Levels may be achieved on a sliding scale up to 20% for Level 3. Fractions of levels are allowed, for example, a 5% enhancement would achieve Level 1 + (5 / 20) x (3 – 1) = Level 1.5. This sliding scale approach provides encouragement to pursue every reduction opportunity possible. Enhancements beyond 20% may be awarded innovation points.

**Ecological Assessment (EcA)**

The EcA measures the degree of ecological values before and after infrastructure development based on an ecological impact assessment which is managed, reviewed or audited by a suitably qualified professional.

It must be demonstrated that it is “probable” (at least a 50% chance) that the enhancement can be achieved. Enhancements should be achievable within a reasonable time-scale. This time-scale may depend on the nature of vegetation and the life-span of the project but would usually be less than 30 years.

World Bank supports the protection, maintenance, and rehabilitation of natural habitats. If the project has been financed by World Bank, it is recommended that evidence of financing has been provided as well as progress report to World Bank on Natural Habitats. For Ecologically Sensitive Habitats, an Ecological Management Plan needs to be developed.

If the Ecological Assessment determined that there is no Ecologically Sensitive Habitat on site, Levels 2 and 3 are not applicable and the project can achieve full points.

**Ecological Management Plan**

An Ecological Management Plan, or similar, may be developed and implemented to demonstrate the management of the long term ecological values of the site (and offsite where offsets are established). This plan should include:

- Management of sensitive ecological habitats.
- A set of measurable ecological objectives, incorporating a list of the values that can be enhanced and a brief summary of the logic and feasibility behind the design.
- A brief explanation of how the ecological value enhancement is likely to be achievable.
- An explanation of how the plan meets each of the principles of biodiversity offsets (if relevant).
- A monitoring program, including a set of performance indicators that will be measured.
- A suggested adaptive management and continual improvement process, including options for maintaining or revising the trajectory of habitat improvements, to maintain the value of outcomes (if necessary).
- Roles and responsibilities.

**Offsets**

Mandatory and/or voluntary offsets may be used as part of the evaluation of change in
ecological value under this credit. Offsets may only apply to 'residual impacts' of development, defined as the predicted remaining impacts after everything has been done to avoid and minimise any loss of ecological value.

Offsets used under this credit must be calculated and assessed, as a priority, in accordance with any existing regional policy that sets out specific measurement criteria. However, if it is desired to exceed these requirements or such processes do not exist, then:

- Measurement criteria may be developed consistent best practice guidance including OECD work on Biodiversity Offsets: Effective Design and Implementation (2016).

- It must be demonstrated that the offsets are permanent and that management regimes are in place to ensure stated outcomes are achieved or maintained.

**Suitably Qualified Professional**

A suitably qualified professional for the purposes of this credit is defined as a professional with an ecology related degree and/or a minimum of five years’ continuous experience working as an ecologist.

Check online ISCA Guidance Repository for latest approved references.
Eco-2 Habitat connectivity

Aim
To reward maintenance or enhancement of habitat connectivity.

Criteria

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is a low or moderate degree of existing habitat connectivity identified. AND The existing degree of habitat connectivity is maintained (offsetting allowed).</td>
<td>There is a low or moderate degree of existing habitat connectivity identified. AND The existing degree of habitat connectivity is enhanced (offsetting allowed).</td>
<td>There is a low or moderate degree of existing habitat connectivity identified. AND The existing degree of habitat connectivity is enhanced (with no offsetting).</td>
</tr>
<tr>
<td>Evidence</td>
<td>Evidence as for Level 2</td>
<td>Evidence as for Level 2</td>
</tr>
</tbody>
</table>

Additional guidance

Definition
Habitat connectivity, also known as landscape or ecological connectivity, reflects the degree to which an organism can move around the landscape due to the presence of suitable habitat. The concept relates particularly to fauna but may also be applied to flora. Recent scientific evidence suggests that the long-term viability of fragmented populations may only be secured through the establishment of ecological connectivity between existing fragments. Enhancements to habitat connectivity are typically achieved through the establishment and maintenance of habitat corridors.

Measuring Habitat Connectivity
Estimation of habitat connectivity is a developing area and there are no currently accepted standards. The definitions in Figure A are provided as suggested guidance only.

Figure A: Degree of connectivity

<table>
<thead>
<tr>
<th>Degree of connectivity</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>Native vegetation in good condition &gt;100m wide that forms a sole link between other native vegetation in good condition.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Low condition native vegetation &gt;100m wide or native vegetation in good condition 50-100m wide that forms part of a sole link between other vegetation in good condition.</td>
</tr>
</tbody>
</table>
Low condition native vegetation >100m wide or native vegetation in good condition >50m wide that is part of one of several links to other native vegetation in good condition.

Nil None of the above.

These definitions are based on 'Biodiversity in Mixed Farming Landscapes in Central Western NSW' (Seddon, Doyle and Briggs, 2005).

**Benchmarks**

Where there is a pre-existing low or moderate degree of habitat connectivity:

- Level 1 requires that this degree of connectivity be maintained. Offsetting may be used.
- Level 2 requires that this degree of connectivity be enhanced including some use of offsets.
- Level 3 requires that this degree of connectivity be enhanced without using any offsets.

Where there is a pre-existing high degree of habitat connectivity:

- Level 1 does not apply. If the high degree of habitat connectivity is not maintained then no score is achieved.
- Level 2 requires that this degree of connectivity be maintained (or enhanced) including some use of offsets.
- Level 3 requires that this degree of connectivity be maintained (or enhanced) without using any offsets.

Short term disruptions to habitat connectivity (e.g. during the construction phase) may be acceptable where they are justified through ecological assessment as having negligible effect on long term habitat connectivity.

**Ecological Assessment**

The degree of habitat connectivity before and after infrastructure development must be based on ecological assessment.

- An enhancement to habitat connectivity is defined as a greater than 20% improvement in the appropriate habitat connectivity metric.
- It must be demonstrated that it is “probable” (at least a 50% chance) that the enhancement can be achieved.
- Enhancements should be achievable within a reasonable time-scale. This time-scale may depend on the nature of vegetation and the life-span of the project but would usually be less than 30 years.
- This Ecological Assessment could be created to meet both Eco-1 and Eco-2 requirements and include the Habitat Connectivity Assessment.

**Ecological Management Plan**

An Ecological Management Plan, or similar, may be developed and implemented to demonstrate the management of the long term ecological values of the site (and offsite where offsets are established). This plan should include:

- Management of sensitive ecological habitats.
- A set of measurable ecological objectives, incorporating a list of the values that can be enhanced and a brief summary of the logic and feasibility behind the design.
- A brief explanation of how the ecological value enhancement is likely to be achievable.
- An explanation of how the plan meets each of the principles of biodiversity offsets (if relevant).
- A monitoring program, including a set of performance indicators that will be measured.
- A suggested adaptive management and continual improvement process, including options for maintaining or revising the trajectory of habitat improvements, to maintain the value of outcomes (if necessary).
- Roles and responsibilities.

This Ecological Management Plan could be created to meet both Eco-1 and Eco-2 requirements.

**Offsets**
Mandatory and/or voluntary offsets may be used as part of the evaluation of change in ecological value under this credit. Offsets may only apply to 'residual impacts' of development, defined as the predicted remaining impacts after everything has been done to avoid and minimise any loss of ecological value.

Offsets used under this credit must be calculated and assessed, as a priority, in accordance with any existing regional policy that sets out specific measurement criteria. However, if it is desired to exceed these requirements or such processes do not exist, then:

- measurement criteria may be developed consistent with best practice guidance including OECD work on Biodiversity Offsets: Effective Design and Implementation (2016);
- it must be demonstrated that the offsets are permanent and that management regimes are in place to ensure stated outcomes are achieved or maintained.

Suitably Qualified Professional

A suitably qualified professional should review the implementation of the plan. For the purposes of this credit a suitably qualified professional is defined as a professional with an ecology related degree and/or a minimum of five years’ continuous experience working as an ecologist.

Check online ISCA Guidance Repository for latest approved references.
People and Place
PEOPLE AND PLACE

Consistent with a triple bottom line approach to sustainability, recognising and addressing social aspects is key to achieving sustainable outcomes in infrastructure delivery and operation.

Infrastructure is designed to service the needs and expectations of society, now and in the future. By its very nature, infrastructure is a servant to society. Well designed infrastructure can leave a positive legacy for current and future generations. In fact, some of our most iconic tourist attractions are pieces of infrastructure (the Sydney Harbour Bridge being the quintessential example).

Infrastructure projects and assets can have significant positive and negative impacts on communities from local to international. As such, the owners, designers, constructors and operators of infrastructure should be considered stakeholders in the community and vice versa. Good community and stakeholder relations contributes to establishing and maintaining a social license to construct and operate and is therefore good business.

The way infrastructure is delivered and operated affects people’s ability to function day to day. Therefore, it has a direct impact on people’s health, wellbeing and safety. Australia generally performs well on rankings of liveability, yet in regards to infrastructure, there is clear room for improvement.

Sensitive urban and landscape design of infrastructure can contribute to:

- Economic and socio-economic performance – encouraging local businesses and entrepreneurship; attracting people to live in an area; providing affordable housing and travel; and providing equitable access to job opportunities, facilities and services;
- Physical scale, space and ambience - affecting the balance between natural ecosystems and built environments;
- Social and cultural environments - how people interact with each other, how they move around, and how they use a place.

The People and Place theme focuses on effects on the wellbeing of communities and the users of the infrastructure, how infrastructure integrates with and enhances the surrounding urban and landscape environment, how the past is recognised and conserved and how stakeholders participate in infrastructure design, construction and operation.

The People and Place theme contains the following categories:

- Community Health, Wellbeing and Safety (Hea)
- Heritage (Her)
- Stakeholder Participation (Sta)
- Urban and Landscape Design (Urb)
COMMUNITY HEALTH, WELLBEING AND SAFETY

By 2050, the world’s urban population is expected to nearly double, making urbanization one of the twenty-first century’s most transformative trends. Populations, economic activities, social and cultural interactions, as well as environmental and humanitarian impacts, are increasingly concentrated in cities, and this poses massive sustainability challenges in terms of housing, infrastructure, basic services, food security, health, education, decent jobs, safety and natural resources, among others (United Nations Conference on Housing and Sustainable Urban Development, Habitat III 2016).

By readdressing the way cities and human settlements are planned, designed, financed, developed, governed and managed, the New Urban Agenda will help to end poverty and hunger in all its forms and dimensions; reduce inequalities; promote sustained, inclusive and sustainable economic growth; achieve gender equality and the empowerment of all women and girls in order to fully harness their vital contribution to sustainable development; improve human health and well-being; foster resilience; and protect the environment.

There are different types of communities - communities of place (within a one to five kilometre radius of the infrastructure asset); communities of interest (e.g. specific groups such as elected representatives, traditional owners, affected landowners) and communities with specific issues (e.g. cycling groups and local businesses).

Wellbeing is a state of being and feeling well, happy and prosperous. Community wellbeing is a concept that encapsulates an optimal quality of healthy community life - one in which people are connected, have equitable access to social networks and infrastructure, meaningful employment, and live in vibrant and sustainable communities with distinct local identities.

Health is defined as fitness, a strong constitution and a state of wellbeing. Health encompasses both physical and mental health. Community health deals with the betterment of health characteristics from a whole of community perspective.

Safety means the avoidance of harm or injury ensuring people are secure and protected. In the community context in relation to infrastructure, safety means that people in the community living near infrastructure or users of infrastructure are able to go about their daily activities without fear for their own safety or the safety of others.

Community health, wellbeing and safety relate closely to the concept of liveability.

Community wellbeing is the foundation of our society. The quality of our natural and built environments, and our access to education, jobs and social and cultural opportunities have significant impacts on community wellbeing, public health outcomes, social inclusion and interaction, and community safety.

Health is related to wellbeing. The World Health Organisation (WHO 2005) acknowledges that “the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being”.

The way infrastructure is designed, constructed and operated affects whether or not it is easy and safe for people to: walk, cycle, participate in active recreation or use public transport, interact with neighbours and other community members, and access health facilities and services. These are all activities that contribute to lifelong health, wellbeing and safety.

Enhancing connections to social infrastructure (such as to parks, walking/ jogging/ cycling/ fitness tracks, swimming pools, sports facilities, clubs, community centres and ovals) encourages healthy lifestyles.

Many of the government indicators are relevant to the infrastructure industry. Measuring wellbeing at the local level is an increasing trend, through community plans that capture the aspirational visions of local communities with measurement by an indicator framework. These community plans will guide the corporate, asset and financial plans and reporting within local government.
Other industries, notably resource company development in third world countries choose to, and are obliged for their own interests, to directly intervene in communities affected by their operations. This includes the delivery and support of health, housing and education infrastructure, active community health campaigns to manage health issues such as malaria, child inoculations etc. Their performance measures are usually qualitative milestones and unique to that location. Some attempts at aggregation are beginning but are generally total activities and year on year comparisons.

The infrastructure industry has taken a strong compliance approach to issues around community health, wellbeing and safety and therefore much effort has been focused on safety where there are generally laws and standards to conform with. This includes OH&S legislation which covers safety in design, and helping to ensure that infrastructure is safe to use and interact with. The areas of less direct impact such as crime prevention and health and wellbeing have typically been considered to be ‘beyond compliance’ and have received less focus by the industry.

Infrastructure projects and assets can have significant positive and negative impacts on communities. Sometimes, by their very nature, they change a community for the long term (e.g. a major motorway ‘splitting’ a suburb). As such, the owners, designers, constructors and operators of infrastructure should be considered stakeholders in the community and vice versa. Contributing to the community as ‘good neighbours’ or ‘good corporate citizens’ should be encouraged, perhaps even expected.

Infrastructure projects and assets can contribute to community health, wellbeing and safety through a wide variety of means. The health, wellbeing and safety outcomes that are appropriate to target are, in the main, context specific so should be identified through stakeholder consultation. Areas such as crime prevention are considered less context dependent and so are areas where most projects or assets should be able to make a positive contribution.

We also recognize that growing inequality and the persistence of multiple dimensions of poverty, including the rising number of slum and informal-settlement dwellers, are affecting both developed and developing countries, and that the spatial organization, accessibility and design of urban space, as well as the infrastructure and the basic services provision, together with development policies, can promote or hinder social cohesion, equality and inclusion (Habitat III 2016).

A community’s wellbeing, health and safety should be sustained and enhanced across the asset’s lifecycle. The credits in this category are designed to encourage moving beyond compliance in minimising impacts to sustaining wellbeing, health and safety and to deliver enhanced outcomes.

This category focuses on how a community’s wellbeing, health and safety can be sustained or enhanced across the asset lifecycle. The following two credits apply:

**Hea-1**  Community health and wellbeing

**Hea-2**  Crime prevention

The Urban and Landscape Design category focuses on the analysis, planning and design of the arrangement, appearance and function of the infrastructure asset within its community and environment. The Community Health, Wellbeing and Safety category, on the other hand, focuses more on specific issues within the community and on measures to contribute positively to long term improvements. There will likely be some overlap between the categories.

Stakeholder participation is important for this category in terms of identifying and contributing to community issues. The Stakeholder Participation category deals with the topic more broadly and particularly focuses on the participation process and its effectiveness.
Hea-1 Community health and wellbeing

Aim

To reward making a positive contribution to community health and wellbeing.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures to positively contribute to community health and wellbeing for one priority issue have been identified and implemented.</td>
<td>Measures to positively contribute to community health and wellbeing for two priority issues have been identified and implemented. AND Monitoring of community health and wellbeing indicators related to the priority issues is undertaken at appropriate intervals during construction of the asset and at practical completion.</td>
<td>Measures to positively contribute to community health and wellbeing for three priority issues have been identified and implemented. AND Monitoring of community health and wellbeing indicators related to the priority issues is undertaken at appropriate intervals during construction of the asset and at practical completion demonstrates improvement of relevant indicators.</td>
<td></td>
</tr>
<tr>
<td>Evidence</td>
<td>Plans, drawings, photos or similar showing implementation of measures.</td>
<td>The evidence for Level 1 Monitoring reports</td>
<td>The evidence for Level 2</td>
</tr>
</tbody>
</table>

Additional Guidance

Identifying Community Issues

Community plans are aspirational documents which capture a vision, and the themes and outcomes sought by communities into the future. These plans identify issues and have measurement indicators to track whether the outcomes being sought are being delivered by the Corporate, Asset and Financial Plans of local government which underpin the Community Plan.

It is recommended that the infrastructure delivery team or asset owner reviews the local government Community Plan (if there is one) to align their plans to the outcomes sought by the community for their future. Other baseline sources include local government Corporate Plans and local hospital health plans.

The health and wellbeing outcomes that are appropriate to target are, in the main, context specific so should be identified through stakeholder consultation. For this reason, stakeholder consultation is recommended to identify the priority community issues.

Measures for Positive Contribution

The measures selected should be tested or further developed with relevant stakeholders. Measures (be they design features, construction or operations programs) must be implemented to address the chosen priority issues.

At least one priority issue for Level 2 and at least 2 priority issues for Level 3 must relate to the relevant UN’s Sustainable Development Goals, see Figure B. Projects should draw particular attention to those Goals where the Country’s SDG Country Index and Dashboards is low (see ISCA’s Guidance Repository). Not all targets within a Goal might be relevant to a project. If that’s the case, projects should explain why these issues are not relevant.

Possible measures could include financial contribution towards the achievement of these...
targets, or partnership with a local social enterprise to demonstrate that the project is working towards the priority issues. Projects are invited to suggest alternative priority issues. These should be issues to ISCA for review prior to use.

Measures can be identified and addressed in concept design and applied in detailed design with the support of the constructor and/or operator. Where measures cannot be addressed through the design, such as contributing to local employment or a skilled workforce, these outcomes can be addressed through the project’s procurement, training or relevant management plans and measured.

**Monitoring of Indicators**

For Levels 2 and 3, monitoring of appropriate indicators must be undertaken to monitor progress.

For Level 3, the monitoring must demonstrate that an improvement has been achieved.

Possible indicators and measures derived from a local government Community Indicator framework are shown in Figure A.

**Small Projects**

Levels 2 and 3 do not apply and full points may be achieved for Level 1.

Check online ISCA Guidance Repository for latest approved references.

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**Figure A: Possible measures and indicators**

<table>
<thead>
<tr>
<th>Possible Project KRAs</th>
<th>Possible Project Indicators</th>
<th>Possible Project Measures</th>
</tr>
</thead>
</table>
| **Community health** | Contribution to community health programs | • Donations to community health programs  
• Fostering community participation in workforce health programs  
• Sharing health program information with the community  
• Promoting community health programs on websites or in newsletters |
| **Active transport** | Access to active transport facilities | Provision or upgrading of, funding for, or maintained or enhanced access to:  
• Off-road paths or on-road lanes, paths or shared roadways that connect logically to the existing pedestrian and cycle network and give pedestrians priority.  
• Infrastructure that doesn't create a barrier to walking or cycling.  
• Secure, undercover bicycle parking spaces and/or end-of-trip facilities  
• Accessible covered public transport shelters  
• Reduction in off-street parking supply in areas with good accessibility to public transport. |
| **Public transport** | Access to public transport facilities | Provision or upgrading of, funding for, or maintained or enhanced access to:  
• Public transport stops or stations  
• Accessible covered public transport shelters  
• Design to local disability and accessibility standards  
• Accessibility assessments are undertaken on the design, the as-built infrastructure and during operation |
<table>
<thead>
<tr>
<th>Possible Project KRA</th>
<th>Possible Project Indicators</th>
<th>Possible Project Measures</th>
</tr>
</thead>
</table>
| Recreation          | Access to recreation facilities | Provision or upgrading of, funding for, or maintained or enhanced access to:  
  • Swimming pool, gym, tennis courts, sports club, athletics field (including track), squash courts, bowling green, golf course, fields with football posts, dog parks, basketball courts, netball court, gym equipment, or running track  
  • Playgrounds  
  • Supported walking areas |
| Recreation          | Contribution to community leisure and recreation activities | Donations to community recreation activities  
  • Participating in community recreation events  
  • Promoting community recreation activities on website or in newsletters  
  • Planning to minimise impacts on recreation events |
| Community connectedness | Access to services and facilities | Preventing community severance through the infrastructure design and site/route selection.  
  Provision or upgrading of, funding for, or maintained or enhanced access to:  
  • Food retail  
  • Community serving retail  
  • Services  
  • Civic and community facilities  
  • Meeting places  
  • Public amenities (e.g. toilets and bubblers)  
  • Community food gardens  
  • Fresh food markets. |
| Community connectedness | Contribution to community connectedness | Donations to community connectedness programs  
  • Facilitating meetings between diverse community sectors  
  • Participating in local events  
  • Running open days  
  • Promoting community connectedness programs on website or in newsletters |
| Community education | Contribution to local education | School visits  
  • Provision of educational material to schools  
  • Donations to child education programs |
| Sustainability awareness | Community sustainability awareness | Provision or upgrading of, funding for, or maintained or enhanced access to:  
  • Sustainability education facilities.  
  • Sustainability information portal.  
  • Infrastructure users guide. |
| Skills development programs | Number of apprentices  
  Number of work experience placements | Apprentice program for construction and operation  
  Work experience placements and internships |
| Local businesses | Access to local businesses  
  Local business activity  
  Local business complaints | Provision or upgrading of, funding for, or maintained or enhanced access to local businesses  
  • Local business surveys  
  • Creation of local business opportunities  
  • Local sourcing policy |
<table>
<thead>
<tr>
<th>Possible Project KRAs</th>
<th>Possible Project Indicators</th>
<th>Possible Project Measures</th>
</tr>
</thead>
</table>
| Local employment     | Proportion of locals in workforce | ● Local employment policy  
● Local employment briefings |
| Local skills         | Contribution to local skills | ● Technical education and university visits  
● Partner in school, university, technical education or registered training organisation training programs  
● Fostering community participation in workforce skills training programs |
| Project economic impacts | Contribution to community welfare programs | ● Donations to community welfare programs  
● Workforce volunteer programs  
● Promoting community welfare programs on website or in newsletters |
| Arts and Cultural Activities | Contribution to community cultural activities | ● Donations to community cultural activities  
● Participating in community cultural events  
● Promoting community cultural activities on website or in newsletters  
● Planning to minimise impacts on cultural events  
● Enhancing community identity through infrastructure artwork  
● Involvement of local artists in infrastructure artwork design |

Figure B: Priority issues and indicators for Developing Countries based on the UN’s Sustainable Development Goals

The UN Sustainable Development Goals and targets provide the regional context that may be used to identify priority issues from which project level programs, measures and initiatives may be identified and implemented through the infrastructure project, either directly or through funding a third party acting on behalf of the project with a demonstrated tangible link to a priority issue.

<table>
<thead>
<tr>
<th>Goals</th>
<th>Targets</th>
</tr>
</thead>
</table>
| Goal 1: End poverty in all its forms everywhere                       | ➔ By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day  
➡ By 2030, reduce by at least half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions  
➡ By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance  
➡ By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters  
➡ Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions  
➡ Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions |
<table>
<thead>
<tr>
<th>Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>➔ By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round</td>
</tr>
<tr>
<td>➔ By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons</td>
</tr>
<tr>
<td>➔ By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment</td>
</tr>
<tr>
<td>➔ By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality</td>
</tr>
<tr>
<td>➔ By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed</td>
</tr>
<tr>
<td>➔ Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries</td>
</tr>
<tr>
<td>➔ Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility</td>
</tr>
<tr>
<td>Goal 3: Ensure healthy lives and promote well-being for all at all ages</td>
</tr>
<tr>
<td>➔ By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births</td>
</tr>
<tr>
<td>➔ By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births</td>
</tr>
<tr>
<td>➔ By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases</td>
</tr>
<tr>
<td>➔ By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being</td>
</tr>
<tr>
<td>➔ Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol</td>
</tr>
<tr>
<td>➔ By 2020, halve the number of global deaths and injuries from road traffic accidents</td>
</tr>
</tbody>
</table>
- By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes
- Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all
- Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate
- Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all
- Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States
- Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

<table>
<thead>
<tr>
<th>Goal 4: Ensure inclusive and quality education for all and promote lifelong learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>- By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and Goal-4 effective learning outcomes</td>
</tr>
<tr>
<td>- By 2030, ensure that all girls and boys have access to quality early childhood development, care and preprimary education so that they are ready for primary education</td>
</tr>
<tr>
<td>- By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university</td>
</tr>
<tr>
<td>- By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship</td>
</tr>
<tr>
<td>- By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations</td>
</tr>
<tr>
<td>- By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy</td>
</tr>
<tr>
<td>- By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development</td>
</tr>
<tr>
<td>- Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all</td>
</tr>
<tr>
<td>- By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology</td>
</tr>
<tr>
<td><strong>Goal 8: Promote inclusive and sustainable economic growth, employment and decent work for all</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>technical, engineering and scientific programmes, in developed countries and other developing countries</td>
</tr>
<tr>
<td>→ By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing states</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Goal 11: Make cities inclusive, safe, resilient and sustainable</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries</td>
</tr>
<tr>
<td>→ Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour intensive sectors</td>
</tr>
<tr>
<td>→ Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises, including through access to financial services</td>
</tr>
<tr>
<td>→ Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead</td>
</tr>
<tr>
<td>→ By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value</td>
</tr>
<tr>
<td>→ By 2020, substantially reduce the proportion of youth not in employment, education or training</td>
</tr>
<tr>
<td>→ Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms</td>
</tr>
<tr>
<td>→ Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment</td>
</tr>
<tr>
<td>→ By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products</td>
</tr>
<tr>
<td>→ Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all</td>
</tr>
<tr>
<td>→ Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-Related Technical Assistance to Least Developed Countries</td>
</tr>
<tr>
<td>→ By 2020, develop and operationalize a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organization</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Goal 11: Make cities inclusive, safe, resilient and sustainable</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums</td>
</tr>
<tr>
<td>By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons</td>
</tr>
<tr>
<td>By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries</td>
</tr>
<tr>
<td>Goal 16: Promote just, peaceful and inclusive societies</td>
</tr>
<tr>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td>▶ Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning</td>
</tr>
<tr>
<td>▶ By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels</td>
</tr>
<tr>
<td>▶ Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials</td>
</tr>
<tr>
<td>▶ Significantly reduce all forms of violence and related death rates everywhere</td>
</tr>
<tr>
<td>▶ End abuse, exploitation, trafficking and all forms of violence against and torture of children</td>
</tr>
<tr>
<td>▶ Promote the rule of law at the national and international levels and ensure equal access to justice for all</td>
</tr>
<tr>
<td>▶ By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime</td>
</tr>
<tr>
<td>▶ Develop effective, accountable and transparent institutions at all levels</td>
</tr>
<tr>
<td>▶ Ensure responsive, inclusive, participatory and representative decision-making at all levels</td>
</tr>
<tr>
<td>▶ Broaden and strengthen the participation of developing countries in the institutions of global governance</td>
</tr>
<tr>
<td>▶ By 2030, provide legal identity for all, including birth registration</td>
</tr>
<tr>
<td>▶ Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements</td>
</tr>
<tr>
<td>▶ Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime</td>
</tr>
</tbody>
</table>
Hea-2 Crime prevention

Aim

To reward design and practice that reduce the likelihood of crime.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The likelihood of crime has been reduced through implementing appropriate CPTED guidelines in design, construction and operation. AND All tunnels or underpasses have end-to-end visibility.</td>
<td>The requirements for Level 1 are achieved. AND Temporary construction diversions and lighting are designed to meet CPTED guidance</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evidence</td>
<td>Design or CPTED reports As-built drawings, asset management plan Crime risk assessment</td>
<td>The evidence for Level 1. Construction plans</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Additional Guidance

Crime Prevention Through Environmental Design (CPTED) is about designing urban environments such that opportunities for offending are reduced and feelings of safety are enhanced. It is based on the philosophy that peoples’ behaviour, particularly in terms of the possibility of offending, as well as an individual’s perceptions about their safety, is influenced by the design of that environment. CPTED aims to reduce opportunities for crime by increasing the risks and efforts for offenders as well as reducing the rewards.

Appropriate CPTED Guidelines

To achieve Level 1, the design, construction and operation of the project or asset must have implemented appropriate CPTED guidelines.

There are a number of CPTED guidelines available throughout Australia. Any of these guidelines may be used to demonstrate compliance provided that they address the CPTED principles in Figure C.

In implementing the appropriate CPTED guidelines, the following steps should be followed:

1. Identify CPTED principles applicable to the infrastructure.
2. Develop a risk assessment methodology.
4. Identify all risk areas (urban structures, activity centres, parks, open spaces, car parking areas and public facilities) with regards to distance to views, safe movement, illumination, access to transport and mobility.
5. Apply the CPTED principles to the infrastructure.

Local police should be invited to comment or to be involved in the process. The design elements in Figure C should be addressed from a safety perspective by the project team.

Tunnels and Underpasses

For Level 1, all pedestrian or cyclist tunnels or underpasses must have end-to-end visibility. Where it can be justified that end-to-end visibility of a tunnel or underpass is not possible or feasible it needs to be demonstrated that an alternative approach using a combination of other CPTED principles to meet the intention of
this credit. This should be supported by a crime risk assessment involving local police.

Evidence could include drawings, design reports, meeting minutes and a written justification describing how the approach has met the CPTED requirements.

**Temporary Construction Aspects**

To achieve Level 2, in addition to the Level 1 requirements, temporary construction diversions and lighting must also be designed to meet the appropriate CPTED guidance. This might be a ‘cut down version’ of the process used for the permanent design but it must nevertheless incorporate implementation of an appropriate CPTED guideline that addresses the CPTED principles in Figure C.

Where this credit has low Materiality, then the Level 2 benchmark does not apply and full points should be awarded where the Level 1 criteria can be met.

Check online ISCA Guidance Repository for latest approved references.

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**Figure C: CPTED Principles**

<table>
<thead>
<tr>
<th>Principle</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Surveillance</td>
<td>Involves placing facilities, streets, people, and views in such a way that the perception that people can be seen is increased.</td>
</tr>
<tr>
<td>Natural access control</td>
<td>Involves designing the environment to clearly mark access points and transitional zones. It involves the design of entrances, exits, lighting, and landscape to create and control access to private spaces.</td>
</tr>
<tr>
<td>Good definition of space and ownership</td>
<td>Involves the use of physical features to express ownership over the environment. Where the above principle details how and when a place can be accessed, this principle attempts to reduce the ambiguity between private and public spaces by expressing ownership.</td>
</tr>
</tbody>
</table>

**Figure D: Design Elements for CPTED**

<table>
<thead>
<tr>
<th>Activity Centres</th>
<th>Car Park Areas</th>
<th>Public Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entries</td>
<td>Ground level off-street car park areas</td>
<td>Automatic teller machines</td>
</tr>
<tr>
<td>Fences and walls</td>
<td>Multi-level car parks</td>
<td>Public toilets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Public telephones</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cycle parking</td>
</tr>
<tr>
<td>Parks and Open Space</td>
<td>Lighting, Landscaping, Walking and Cycling Paths</td>
<td>Public transport stops, interchanges and stations</td>
</tr>
<tr>
<td>Lighting</td>
<td></td>
<td>Lighting</td>
</tr>
<tr>
<td>Landscaping</td>
<td></td>
<td>Signage</td>
</tr>
<tr>
<td>Walking and Cycling Paths</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**HERITAGE**

UNESCO defines the term Cultural Heritage as encompassing several main categories of heritage:

**Cultural heritage**

- Tangible cultural heritage:
  - movable cultural heritage (paintings, sculptures, coins, manuscripts)
  - immovable cultural heritage (monuments, archaeological sites, and so on)
  - underwater cultural heritage (shipwrecks, underwater ruins and cities)
- Intangible cultural heritage: oral traditions, performing arts, rituals

**Natural heritage**: natural sites with cultural aspects such as cultural landscapes, physical, biological or geological formations

**Heritage in the event of armed conflict**

Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and values. Cultural Heritage is often expressed as either Intangible or Tangible Cultural Heritage (ICOMOS, 2002).

This category focuses on cultural heritage, rather than natural heritage, which recognises the dynamic ecological and evolutionary processes, evolution and the ability of ecosystems to be self-perpetuating. In the IS rating tool, natural heritage is addressed within the ‘Ecology’ and ‘Urban and Landscape Design’ categories.

Those places or items that become our heritage are valued not only in their own right as tangible landscapes, objects, structures, buildings or artefacts, but they are also valued for their intangible benefits such as creating a sense of place and a context for living culture. They encourage community interaction and so facilitate the social and cultural layering by current and future generations. Unacceptable or avoidable trade-offs in relation to heritage and associated cultural icons, places and experiences can mean a failure to the communities which hold these values in significance.

Places of heritage significance have the potential to make lasting contributions to the sustainability of infrastructure assets at all stages including planning, construction, operation and maintenance. The embodied energy contained in a heritage building can reduce resource use and greenhouse gas emissions. The identification of potential Aboriginal and Torres Strait Islander heritage values can enhance community relations and enrich the broader society. The preservation of natural heritage can allow future generations to enjoy these landscapes. These factors present significant opportunities. Adaptive re-use, community engagement, sensitive and appropriate preservation and conservation techniques together with due consideration of how an infrastructure asset can enhance people’s connections to their past means that a considered approach to heritage can have rewards for the built and natural environment, the project or asset, and the community.

For this reason, the purpose of this category is to reward project/assets that not only identify and address heritage places, but also adapt their heritage strategy to methodologies that ensure mitigation and management is undertaken in a way that involves and engages the proponent and the community with each other. An important outcome of this is trust and transparency.

The aim of this category is that cultural heritage is appropriately valued, promoted, recognised and addressed in asset design and delivery. Design is sensitive and sympathetic to heritage aspects and associated community values. Construction is undertaken in a manner, which minimises adverse impacts.

While there is a range of international, federal, state, local, and community based agencies and organisations that have prepared legislation and guidelines and/or policies to protect heritage, it is the specific parameters and local context of each asset that are the key considerations. While satisfying and meeting
legislative requirements must be the starting point for any proponent’s engagement with heritage, it is understanding and engaging with the communal attachment to heritage places that provides an opportunity for any asset to both conserve heritage and make a significant and lasting contribution to the community.

The intent is to assist the design, delivery and operation of infrastructure assets where heritage outcomes are part of each phase of the asset life-cycle. Infrastructure assets need to be seen as helping to conserve, promote and enhance heritage in a way that satisfies asset delivery and the communities for which heritage is significant. Proactive engagement on these issues does not mean adopting a compliance tick box approach after the design is finalised. It means a willingness to engage and seek negotiated outcomes with authorities and communities. The aim is to take heritage considerations beyond the minimal compliance mind set of checking ‘known’ listings of national and international registers to an approach which enables all parties to accept that infrastructure assets do have a role in conserving and maintaining tangible and intangible heritage for communities.

This category focuses on how heritage is assessed and then managed through design, construction and operation of infrastructure. The following two credits apply to this category:

**Her-1** Heritage assessment and management

**Her-2** Monitoring of heritage

This category connects to the Urban and Landscape Design category in that good urban and landscape design should take into account heritage values identified in this category. Re-use of heritage structures and components is likely to be rewarded in the Materials category as well as this category.

Stakeholder participation is important for this category in terms of identifying and contributing to identification and enhancement of heritage values. The Stakeholder Participation category focuses on the participation process and its effectiveness.
Heritage assessment and management

**Aim**

To reward the development of baseline assessment of heritage and predictions against which improvements can be measured.

**Criteria**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Community heritage values have been identified through consultation and integrated into studies. AND Measures to minimise adverse impacts to heritage during construction and operation have been identified and implemented.</td>
<td>The requirements for Level 1 are achieved. AND Community and key stakeholders have participated in the heritage studies. AND Heritage values beyond those listed in government registers have been identified, considered and addressed. AND Heritage has been interpreted to promote local heritage values.</td>
<td>The requirements for Level 2 are achieved. AND Opportunities have been identified and implemented to enhance heritage values.</td>
</tr>
</tbody>
</table>

**Additional Guidance**

**Assessment**

A heritage assessment should be conducted in accordance with international or local definitions. Baseline surveys of existing heritage should form part of the assessment, as should predictions for heritage impacts during construction and operation of the infrastructure.

Community heritage values must be identified through consultation and integrated into the heritage studies. Measures to minimise adverse impacts to heritage during construction and operation must be identified and implemented.

Where Heritage has low Materiality, consultation is not required.

**Participation in Heritage Surveys**

For Level 2, community and key stakeholders must participate in the heritage studies. This may be through review, participation in site visits, and/or consultation meetings to discuss issues.

Where Heritage has low Materiality, this participation is not required.

**Going Beyond Registers**

For Level 2, a broader approach to heritage is required that builds on the review of heritage registers. This includes investigation of intangible heritage values that may be known by, or may be important to the community and include heritage precincts, and heritage items and places in the vicinity that may be adversely impacted by proximity to the infrastructure project or asset.

Where Heritage has low Materiality, this criterion does not apply.
Interpretation

For Level 2, the interpretation of the heritage must at least include the following:

1. Details on the history of the area;
2. The location and extent of historic and cultural heritage sites;
3. Objectives of interpretation; and
4. An Interpretation Plan (or similar) to enrich an understanding of the place while providing guidance for aspects of the development of the area that will build on its unique characteristics.

Interpretation methods that promote heritage values could include:

- **Installations**: that may include public art/artwork, sculptures and similar items.
- **Signage and landmarks**: that reinforce community and historical identity.
- **Design standards/guidelines**: that promote the historical significance and cultural values of the place.
- **Plantings**: that are relevant to the places or items.
- **Hard landscaping**: that may include boardwalks, seating and other structures.
- **Promotion and marketing**: that may include campaigns to raise awareness about the cultural values of the site and invite involvement/visitation.

Enhancement

For Level 3, not only must heritage be preserved and promoted, but opportunities need to have been identified to enhance heritage values and these must have been implemented. An example of this might be restoring and reusing a dilapidated heritage structure as part of the infrastructure asset or for some alternative community use. Other enhancement opportunities include:

- **An Adaptive Reuse**: Adaptive reuse is the extensive alteration, restoration, and/or renovation, of an existing structure or building, so it may serve a new purpose. The new purpose can be for any required use within the project/asset, and is not necessarily required to be used as a facility for community resources.
- **Tourism, information, and education operations**: that may include interpretation facilities, tours, trails, exhibitions, community websites, or similar.
- **Merchandising**: that may include items that can be purchased by the public that directly interpret and/or raise awareness of the cultural heritage values.
- **Celebratory events**: that may include local festivals, commemoration days or other events that are open to the public.

Suitably Qualified Professional

Heritage aspects relevant to this credit must be managed, reviewed or audited by a suitably qualified professional. A suitably qualified professional is someone who has a formal cultural heritage qualification and minimum of five years’ experience.

Check online ISCA Guidance Repository for latest approved references.
Her-2 Monitoring of heritage

Aim
To reward monitoring of impacts on heritage.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring of heritage is undertaken at appropriate intervals during construction and operation.</td>
<td>The requirements for Level 1 are achieved. AND Monitoring and modelling demonstrates maintenance of heritage values.</td>
<td>The requirements for Level 2 are achieved. AND Monitoring and modelling demonstrates enhancements to heritage values.</td>
<td></td>
</tr>
</tbody>
</table>

| Evidence – Developed Countries | Monitoring plans. Monitoring reports. | Evidence as for Level 1 CV’s of suitably qualified professional or committee terms of reference. Oversight reports or meeting minutes. | Evidence as for Level 2 |

Additional Guidance

This credit is not applicable to the Design rating.

Monitoring
A monitoring plan should be developed that describes what is monitored, how, by whom and at what frequency. Monitoring reports should be prepared describing the success or otherwise of heritage management and any recommended adjustments to the management practices and/or the monitoring program.

In some cases, it may be appropriate to include ‘triggers’ for monitoring in a plan, whereby monitoring would only be required if a trigger occurred. For example, common trigger is an ‘unexpected find’ protocol.

Developing Countries
IFC’s Performance Standard 8, Cultural Heritage include guidelines for the Protection of Cultural Heritage in Project Design and Execution. To demonstrate compliance with Level 1, confirmation of IFC funding and progress report around Cultural Heritage can also be submitted as evidence.

Heritage Oversight
For Level 2 and 3, a suitably qualified professional or committee should oversee heritage monitoring. A suitably qualified professional is someone who has a formal cultural heritage qualification and minimum of five years’ experience. Where a heritage committee is used, it should involve client, contractor and community representatives. Committee oversight may be through review, participation in site visits, and/or consultation meetings to review status.

Enhancement
For Level 3, monitoring (or modelling of future states) must demonstrate that heritage values have been (or will be) successfully enhanced. See Her-1 for more explanation about enhancement.

Check online ISCA Guidance Repository for latest approved references.
STAKEHOLDER PARTICIPATION

Stakeholder participation refers to the processes and mechanisms that enable stakeholders who have a direct or indirect interest in infrastructure development to be part of decision-making, from design to construction, to operation (and to decommissioning).

Effective stakeholder participation in the planning and delivery of infrastructure can deliver better social, economic and environmental outcomes. One of the key purposes of stakeholder participation is to capture local knowledge to inform better project outcomes and involve the community in the planning and delivery of the infrastructure.

The primary purpose of stakeholder participation during each phase of the project lifecycle is summarised in Table 1.

The environment in which decisions concerning infrastructure development are made is evolving as a result of global trends such as the growing awareness of and response to environmental, social and economic concerns. Among the responses to these trends is a greater willingness to consider greater stakeholder participation during infrastructure development. Stakeholder participation is increasingly recognised both domestically and internationally as essential to infrastructure sustainability development.

One of the major challenges is balancing the development of infrastructure projects with economic, social and environmental factors. Broader trends in sustainability and infrastructure development have been driven by the need to improve the environmental, social and economic performance of projects and assets during construction and whole-of-life performance. Infrastructure projects not built to acceptable standards risk being not adopted by the communities in which they are built.

Kraatz (2009) points out that the link between sustainability and stakeholder participation in infrastructure developments has strengthened for a number of reasons, including:

- Sustainability requires the inclusion of environmental and social indicators, thus requiring stakeholder engagement to properly understand these less tangible project outcomes
- The environment is often now considered as a stakeholder
- That reporting frameworks (such as the Global Reporting Initiative), include public participation as a part of their measurement base
- The trend toward standards and guidelines supporting stakeholder participation and enabling effective reporting is becoming more mainstream. Examples include (Kraatz, 2009):
  - The Global Reporting Initiative (2000), including a ‘sector supplement’ for construction and real estate
  - The AA1000APS and AA1000SES – AccountAbility Principles Standard (2008) and Stakeholder Engagement Standard (2011) which are designed to provide a framework to help ensure stakeholder engagement is effective and accountable
Table 1 Stakeholder Participation and the Project Lifecycle (Adapted from International Finance Corporation (IFC) 2007)

<table>
<thead>
<tr>
<th>Infrastructure lifecycle phase</th>
<th>Primary Purpose of Stakeholder Participation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning and Design</td>
<td>To gauge potential local support for, or opposition to, different project options and alternatives; and identify key issues and concerns that might affect the viability of the project.</td>
</tr>
<tr>
<td>Construction</td>
<td>Stakeholder participation in the construction phase can often set the tone for community, local government and other external relationships for the remainder of the project’s operational life. The primary purposes of stakeholder participation during construction are: to involve stakeholders in assessing whether measures are working as intended; to respond to grievances; and to identify alternatives where there are failings.</td>
</tr>
<tr>
<td>Commissioning</td>
<td>Change of personnel (including contractors) during the period of transition from construction to operations (i.e. commissioning) can adversely affect ongoing stakeholder relationships and needs to be carefully managed to ensure continuity in relationships. The primary purpose of stakeholder participation during commissioning is to manage the transition of stakeholder relationships.</td>
</tr>
<tr>
<td>Operations</td>
<td>Stakeholder participation during the operational phase of a project should be an integral component of operations management, whether it be day-to-day operational activities, periodic programs, or in emergency situations. The primary purposes of stakeholder participation during operations are: to continue to disclose, consult and report to stakeholders as needed; to ensure integration of ongoing stakeholder commitments into operations management systems; and to manage grievances.</td>
</tr>
<tr>
<td>Decommissioning</td>
<td>The range of stakeholders potentially affected by (or influential in) decommissioning will likely be different from those at earlier stages of a project. The primary purposes of stakeholder participation during decommissioning are: to consult on transfer and management of assets and liabilities; to communicate with stakeholders early to allay fears and uncertainty; to provide regular updates and progress reports; and to manage grievances.</td>
</tr>
</tbody>
</table>

Grutzner (2008) describes one of the main trends driving increased public participation in infrastructure as being risk management and cites the following potential risks for failing to engage the public adequately:

- Inadequate information for sound decision-making.
- Stakeholder alienation, confrontation of conflict.
- Lack of community cooperation.
- Expensive solutions to public issues.
- Reputational damage.
- Lack of government support for the project.

Advantages for adopting participatory processes, adapted from ADB (1996), include:

- More appropriate infrastructure that fits the needs of the community and end users.
- Better implementation and sustainability.
- More complete utilisation and increased ownership.
- Greater efficiency, understanding, and better planning, based on the concerns and ideas of a wide range of participants.
- A better match between human capabilities and capital investments.

Several mechanisms are available to support the incorporation of stakeholder participation into infrastructure development. One of the most widely recognised internationally is the
International Association of Public Participation (IAP2) spectrum of public participation. The IAP2 identifies a number of levels at which stakeholders can participate in decisions and a range of techniques that can be used to foster that participation. The different levels outlined in Table 2 are useful way to determine the scope of public participation.

This description encompasses a range of participatory processes from 'inform' to 'empower' and includes the corresponding goals, promise to the public and examples of techniques.

IAP2 also identified seven core values for public participation as follows (IAP2):

1. Public participation is based on the belief that those who are affected by a decision have a right to be involved in the decision-making process.
2. Public participation includes the promise that the public’s contribution will influence the decision.
3. Public participation promotes sustainable decisions by recognising and communicating the needs and interests of all participants, including decision makers.
4. Public participation seeks out and facilitates the involvement of those potentially affected by or interested in a decision.
5. Public participation seeks input from participants in designing how they participate.
6. Public participation provides participants with the information they need to participate in a meaningful way.
7. Public participation communicates to participants how their input affected the decision.

In 2015 IAP2 released a quality assurance standard for community and stakeholder engagement (IAP2 2015) which seeks to provide a quality process by which engagement projects can be assessed. This standard uses an 11-step process as outlined in Error! Reference source not found..

There are some good examples of public and private entities embracing stakeholder participation in infrastructure development and achieving enhanced outcomes (two Australian examples are included as case studies in this section). An evaluation of stakeholder participation processes by ADB (2003) found the most successful examples were where participatory processes included stakeholders in its decision-making processes at all stages of the project cycle. ADB (2003) also found that although it is important for stakeholder participation processes to be applied to the later stages of the project cycle, these are less critical to project performance than the earlier stages.

The IFC has also released several guidance documents to help companies with stakeholder participation in developing countries. These include:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts, Stakeholder Engagement Section
- Addressing Grievances From Project-Affected Communities

For stakeholder participation processes to be effective they must be credible, different from traditional community consultation methods (Hartz-Karp, 2010), tailored to specific situations, adopted by all stakeholders and lead to outcomes. Furthermore, the effectiveness of stakeholder participation is greatly enhanced by building effective relationships with communities of interest early in the project lifecycle.
Table 2 IAP2 Spectrum of Public Participation (Source IAP2 2010a)

<table>
<thead>
<tr>
<th>Increasing Level of Public Impact</th>
<th>Inform</th>
<th>Consult</th>
<th>Involve</th>
<th>Collaborate</th>
<th>Empower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public participation goal</td>
<td>To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.</td>
<td>To obtain public feedback on analysis, alternatives and/or discussions.</td>
<td>To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.</td>
<td>To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.</td>
<td>To place final decision-making in the hands of the public.</td>
</tr>
<tr>
<td>Promise to the public</td>
<td>We will keep you informed.</td>
<td>We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.</td>
<td>We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.</td>
<td>We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendation into the decisions to the maximum extent possible.</td>
<td>We will implement what you decide.</td>
</tr>
</tbody>
</table>
| Example techniques                | • Fact sheets  
• Web sites  
• Open houses | • Public comment  
• Focus groups  
• Surveys  
• Public meetings | • Workshops  
• Deliberative polling | • Citizen advisory committees  
• Consensus building  
• Participatory decision-making | • Citizen juries  
• Ballots  
• Delegated decision |
This category focuses on developing a strategic and planned approach to stakeholder participation, managing and monitoring implementation of the participation process, achieving a high level of participation for negotiable issues, effectively communicating and effectively addressing community concerns.

There are four credits in this category:

- **Sta-1** Stakeholder engagement strategy
- **Sta-2** Level of engagement
- **Sta-3** Effective communication
- **Sta-4** Addressing community concerns

These credits align loosely with steps in the process as follows: Sta-1 – step 6, Sta-2 steps 2 and 3, Sta-3 – steps 9 and 10, and Sta-4 – step 8. This category measures process performance rather than outcomes but the participation process is vital to achievement of many of the outcomes measured elsewhere in the rating tool.

This category links strongly to the other ‘People and Place’ categories since they are all strongly influenced by the perceptions and values of the community and other stakeholders.

There are some linkages to the Management Systems category since some of these credits call for public statements and reporting (e.g. Man-1 and Man-6).
Sta-1 Stakeholder engagement strategy

Aim
To development and implementation of a comprehensive stakeholder engagement strategy.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A comprehensive stakeholder engagement strategy is developed.</td>
<td>The requirements for Level 1 are achieved. AND The strategy is implemented and formal monitoring, evaluation and corrective action is undertaken. AND The community is informed of the draft strategy and provided an opportunity to give feedback. Community feedback is documented and used to guide completion of the final strategy.</td>
<td>The requirements for Level 2 are achieved. AND Stakeholders, including the community, have input to the strategy by way of a facilitated workshop(s) OR The strategy is independently reviewed.</td>
<td></td>
</tr>
</tbody>
</table>

| Evidence | Stakeholder engagement strategy Community relations plan | Evidence as for Level 1. Community feedback on the strategy Iterations of the strategy to show progress and changes have been made | Evidence as for Level 2. Minutes of workshop. Review report |

Additional Guidance

Stakeholder Engagement Strategy
A comprehensive stakeholder engagement strategy should include:
- A commitment statement that demonstrates a high level of commitment to stakeholders and that the engagement processes are valued.
- Objectives that determine the level of engagement appropriate to the needs of the project.
- Regulations and requirements.
- A summary of previous community engagement activities.
- An analysis of stakeholders including a table that identifies all relevant stakeholders and indicates their likely level of interest in the project and their specific issues.
- A community engagement program including a description of project specific stakeholder engagement techniques that respond to the objectives, level of engagement and the stakeholder analysis.
- A timetable including key community engagement milestones that demonstrate early engagement activities and milestones for reviewing and responding to feedback.
- Resources and responsibilities.
- A community feedback and complaints procedure.
- Monitoring and reporting.
- Management functions.
- An evaluation process that is linked to the stakeholder engagement objectives for the project. The evaluation process should also include the identification and implementation of any required corrective action(s).

The strategy must be managed, reviewed or audited by a suitably qualified professional.

Review
For Level 2, consulting with the community on the draft strategy can be done through a representative community group as long as it can be demonstrated that the group suitably represents the community (including through stakeholder analysis).

Consultation and review on the strategy must be completed at least once at the start of the project phase and before consultation formally begins. Further consultation should then be completed throughout project delivery with feedback informing the stakeholder strategy and engagement processes.

The consultation need not to address the whole strategy document as long as all aspects of a comprehensive stakeholder engagement plan are addressed or it can be justified that any aspect is either not applicable or could not be provided.

Where disadvantaged, vulnerable or indigenous groups are present, they must be involved in the consultation process.

According to IFC’s Performance Standard 1, disadvantaged or vulnerable status may stem from an individual’s or group’s race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth, or other status. The client should also consider factors such as gender, age, ethnicity, culture, literacy, sickness, physical or mental disability, poverty or economic disadvantage, and dependence on unique natural resources.

Additional guidance that involuntarily displacement of people and impacts to land access rights are now covered in Lan-1.

For Level 3 there are two review options:

1. Stakeholders, including the community, have input to the strategy by way of a facilitated workshop(s), or
2. Independent review.

To demonstrate independence, the following criteria must be satisfied:

1. The person(s) must not work directly on the project or asset.
2. The person(s) must be engaged to act independently of the project or asset. This could be demonstrated through a scope of works, signed contract, charter, Memorandum of Understanding (MoU), services agreement, commitment statement etc.

The person(s) may be from a client, parent company or third party.

The results of the independent review should be documented and should highlight the findings and recommendations. If independent review is undertaken, this may replace the requirement for a suitably qualified professional to manage, review or audit the strategy.

Suitably Qualified Professional

A suitably qualified professional:

(a) has at least five years’ experience in stakeholder engagement, is a current member of the International Association for Public Participation and has completed the IAP2 Certificate In Public Participation or equivalent, or

(b) has at least ten years’ experience in stakeholder engagement.

Stakeholder Engagement Strategy Process

Projects can use IAP2, IFC’s “Stakeholder Engagement, A Good Practice Handbook for Companies Doing Business in Emerging Markets”, or other ISCA approved processes to demonstrate compliance with the credit requirements.

Package Projects within Larger Overall Projects

Where a registered project/asset is a package within an overall larger project, and engagement with the community is undertaken on a whole of project basis, then documentation and evidence may be provided which references engagement activities associated with the overall project (i.e. it need not be specific to the registered package project).

It must be demonstrated that engagement strategies, mapping and or baseline information considered the registered package project as part of the overall project scope. Specifically, engagement/consultation documentation must:
• Show that stakeholders were encouraged to consider the package project.
• Have been conducted by an organisation with direct influence over the package project as well as the overall larger project.
• Show that the package project was not a new or substantially different component to that contemplated at the time of the consultation.
• Show that the timeline for engagement aligns with the overall and package portions of the project so that it was possible and reasonable for an interested stakeholder to make comment on the package project that could have been influential on decisions pertaining to the package project.

Small Projects
Levels 3 does not apply and full points can be achieved for Level 1.

Check online ISCA Guidance Repository for latest approved references.
Sta-2 Level of engagement

Aim
To reward an appropriately high level of engagement, particularly on negotiable issues.

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negotiable issues are identified and the level of participation on these issues is at least ‘consult’ or higher on the IAP2 spectrum or ‘consultation’ or higher in the spectrum of stakeholder engagement. AND Stakeholders are informed about non-negotiable issues.</td>
<td>Negotiable issues are identified and the level of participation on these issues is at least ‘involve’ or higher on the IAP2 spectrum or ‘participation’ or higher in the spectrum of stakeholder engagement. AND Stakeholders are informed about non-negotiable issues.</td>
<td>Negotiable issues are identified and the level of participation on these issues is at least ‘collaborate’ or higher on the IAP2 spectrum or ‘negotiations and partnerships’ in the spectrum of stakeholder engagement. AND Stakeholders are informed about non-negotiable issues.</td>
<td></td>
</tr>
<tr>
<td>Stakeholder engagement plan Stakeholder meeting minutes Community newsletters Stakeholder letters Stakeholder engagement database</td>
<td>Evidence as for Level 1.</td>
<td>Evidence as for Level 2.</td>
<td></td>
</tr>
</tbody>
</table>

Additional Guidance

In infrastructure development there are likely to be elements that cannot be influenced by stakeholders. This may be due to budget, viability, safety or legislative requirements. These elements are the non-negotiable issues and need to be clearly communicated to stakeholders. It is important to clarify the opportunity for community change and input and therefore focus stakeholder attention on the “negotiables” or the aspects that they can influence.

It is considered highly unlikely that there will be no negotiable issues for infrastructure development. Once identified, negotiable issues should be clarified with a statement about the intent and issues to be dealt with and details of how stakeholders are being asked to participate and why.

It is important that stakeholders understand what is and isn’t negotiable and why. Stakeholder engagement conducted merely in order to tick the boxes rather than to achieve a consultative goal becomes arbitrary and consultation becomes superfluous, time consuming and unsatisfactory, especially for stakeholders whose opinions are not heard.

Refer to Error! Reference source not found. for details of the IAP2 Spectrum showing examples of stakeholder engagement methods to use when communicating negotiable and non-negotiable issues.

The level of participation undertaken for each negotiable issue should be defined based on stakeholder mapping and issues analysis (as per a Stakeholder Engagement Strategy or similar (see Sta-1)). The level achieved for this credit will be based on the highest level of participation achieved for any negotiable issue. This means, for example, that not all of the participation will need to be at the ‘involve’ level to achieve Level 2 (some participation could be at the ‘consult’ level where appropriate, and at the ‘inform’ level for non-negotiable issues).

The level of engagement can be determined using the IAP2 OR the IFC spectrum of engagement.

Government-Led Stakeholder Engagement
IFC’s Performance Standard 1 makes specific reference to private sector responsibilities under Government-Led stakeholder engagement, as political input or suasion may skew the engagement process, either forcefully or because of lack of experience. In this case, the IFC states that where stakeholder engagement is the responsibility of the host government, the client will collaborate with the responsible government agency, to the extent permitted by the agency, to achieve outcomes that are consistent with the objectives of IFC’s Performance Standard 1. In addition, where government capacity is limited, the client will play an active role during the stakeholder engagement planning, implementation, and monitoring. If the process conducted by the government does not meet the relevant requirements of the Performance Standard, the client will conduct a complementary process and, where appropriate, identify supplemental actions.

**Package Projects within Larger Overall Projects**

Where a registered project/asset is a package within an overall larger project, and engagement with the community is undertaken on a whole of project basis, then documentation and evidence may be provided which references engagement activities associated with the overall project (i.e. it need not be specific to the registered package project).

It must be demonstrated that engagement strategies, mapping and or baseline information considered the registered package project as part of the overall project scope. Specifically, engagement/consultation documentation must:

- Show that stakeholders were encouraged to consider the package project.
- Have been conducted by an organisation with direct influence over the package project as well as the overall larger project.
- Show that the package project was not a new or substantially different component to that contemplated at the time of the consultation.
- Show that the timeline for engagement aligns with the overall and package portions of the project so that it was possible and reasonable for an interested stakeholder to make comment on the package project that could have been influential on decisions pertaining to the package project.

Check online ISCA Guidance Repository for latest approved references.
### Sta-3 Effective Communication

**Aim**

To reward ongoing, clear, timely and relevant communication with the community.

**Criteria**

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
</table>
| Benchmark | The community has been provided with information that:  
- was provided in a timely manner  
- supported community participation  
- was meaningful and relevant  
- was accessible  
AND  
This has been verified by:  
- internal management/reviews/audits OR  
- community feedback with 65-80% support | The community has been provided with information that:  
- was provided in a timely manner  
- supported community participation  
- was meaningful and relevant  
- was accessible  
AND  
This has been verified by:  
- independent reviews/audits OR  
- community feedback with >80% support | Not applicable |
| Evidence | Community survey(s) or equivalent  
Stakeholder engagement strategy  
Community relations plan  
Management, review or audit reports | Evidence as for level 1. | Not applicable |

**Additional Guidance**

**Verification**

The effectiveness of communication must be verified by either:

(a) management, review or audit of the communication process, or  
(b) through community feedback.

**Management/review/audit**

For this option, for Level 1, the communication process must be managed (overseen), reviewed, or audited by an internal suitably qualified professional. This could be evidenced by management, review or audit reports. For Level 2, the communication process must be reviewed or audited by an independent suitably qualified professional.

To demonstrate independence, the following criteria must be satisfied:

- The person(s) must not work directly on the project or asset  
- The person(s) must be engaged to act independently of the project or asset. This could be demonstrated through a scope of works, signed contract, charter, Memorandum of Understanding (MoU), services agreement, commitment statement etc.  
- The person(s) may be from a client, parent company or third party.

A suitably qualified professional must:

- have at least five years’ experience in stakeholder engagement, is a current member of the International Association for Public Participation and has completed the IAP2 Certificate In Public Participation or equivalent, or
• have at least ten years’ experience in stakeholder engagement.

**Community Feedback**

Community feedback could be obtained through community surveys or similar. Surveys should be undertaken at least once during the design phase, annually during construction and at least every two years during operation. Where the duration of the phase is less than this period, then at least one survey must be undertaken. The size, nature and representation of community surveyed should be determined from stakeholder analysis (like that required for Sta-1) and justified. Surveying representative community groups may be suitable. Alternatives to community surveys such as well constructed and analysed complaint and enquiry databases, may be suitable but must be justified.

**Developing Countries**

Developing Countries can use IFC’s, “Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets”.

Check online ISCA Guidance Repository for latest approved references.
Sta-4 Addressing community concerns

Aim

To reward proper consideration and addressing of community concerns (or grievance).

Criteria

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The community believe their concerns have been considered and addressed. AND This has been verified by:</td>
<td>The community believe their concerns have been considered and addressed. AND This has been verified by:</td>
<td>Not applicable</td>
</tr>
<tr>
<td></td>
<td>• internal management/ reviews/ audits OR</td>
<td>• independent reviews/ audits OR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• community feedback with 65-80% support</td>
<td>• community feedback with &gt;80% support</td>
<td></td>
</tr>
<tr>
<td>Evidence</td>
<td>Community survey(s) or equivalent. Stakeholder engagement strategy Community relations plan Management, review or audit reports</td>
<td>Evidence as for Level 1.</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Additional Guidance

If stakeholder concerns / issues /feedback are not adequately addressed and incorporated into project delivery / operations, stakeholder satisfaction will be low and the potential for opposition to the project will be increased. Furthermore, stakeholders are less likely to feel valued and less likely to be involved in future stakeholder participation processes.

Verification

The effectiveness of addressing community concerns (grievance) must be verified by either:

(a) management, review or audit of the feedback process, or
(b) through community feedback.

Management/review/audit

For this option, for Level 1, the feedback process must be managed (overseen), reviewed, or audited by an internal suitably qualified professional. This could be evidenced by management, review or audit reports. For Level 2, the feedback process must be reviewed or audited by an independent suitably qualified professional.

To demonstrate independence, the following criteria must be satisfied:

- The person(s) must not work directly on the project or asset
- The person(s) must be engaged to act independently of the project or asset. This could be demonstrated through a scope of works, signed contract, charter, Memorandum of Understanding (MoU), services agreement, commitment statement etc.
- The person(s) may be from a client, parent company or third party.

A suitably qualified professional must:

- have at least five years’ experience in stakeholder engagement, is a current member of the International Association for Public Participation and has completed the IAP2 Certificate In Public Participation or equivalent, or
- have at least ten years’ experience in stakeholder engagement.

Community Feedback
Community feedback could be obtained through community surveys or similar. Surveys should be undertaken at least once during the design phase, annually during construction and at least every two years during operation. Where the duration of the phase is less than this period, then at least one survey must be undertaken. The size, nature and representation of community surveyed should be determined from stakeholder analysis (like that required for Sta-1) and justified. Surveying representative community groups may be suitable. The same survey may be used for this credit and Sta-3. Alternatives to community surveys such as well constructed and analysed complaint and enquiry databases, may be suitable but must be justified.

Developing Countries

Developing Countries can use IFC’s, “Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets” and IFC’s “Addressing Grievances From Project-Affected Communities” for guidance on how to achieve the requirements for this credit.

Check online ISCA Guidance Repository for latest approved references.
Innovation
INNOVATION

Innovation is the creation of better or more effective products, processes, services, technologies, or ideas that are accepted by markets, governments, and society.

Innovation can:

- involve products or processes i.e. changes to things we use or changes to how products are made,
- occur as relative change (when something better and/or cheaper comes along), or as absolute change (which delivers something entirely new), and
- be sudden and transformative, or it can be incremental.

The changes that enable and accompany innovation fall into three main categories:

2. Changes in the market, or the demand for new or existing technologies.
3. Changes in the institutions that link, enable and encourage the first two components to come together.

The process of innovation occurs if just one of these three areas changes and is driven by both science-push and demand-pull - there is a flow of information and knowledge between and within companies, from science to marketing to the end-users. Innovation is a systemic process, in which the linkages are at least as important as the actors.

The global drive for higher living standards coupled with population growth is placing considerable stresses on our planet. Innovations and new technology can provide ways to reduce the environmental impacts of development and promote social progress through smarter ways of conducting our activities.

ISCA recognises the key role that innovation plays in our economy, society and environment. The IS rating tool specifically aims to support efforts by industry to find innovative ways to achieve more sustainable outcomes.

The Innovation category is included in the IS rating tool as a way of rewarding the spread of innovative technologies, designs and processes for infrastructure applications that impact upon sustainability performance. The category also recognises efforts which demonstrate that sustainability principles have been incorporated outside the scope of the existing rating tool.

The following credit applies to the Innovation category:

**Inn-1  Innovation strategies and technologies**

Innovative technologies, designs and processes may be applied to any of the other categories to achieve good outcomes. Innovations that contribute to achieving credits in other categories can also apply to this category if they meet the credit criteria.

Sharing of innovations is encouraged and may contribute to achievement of the Knowledge Sharing credit (Man-6).
Inn-1 Innovation strategies and technologies

**Aim**
To reward pioneering initiatives in sustainable design, process or advocacy.

**Criteria**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Evidence</th>
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</thead>
<tbody>
<tr>
<td>Level 0 to 10 on a sliding scale</td>
<td>Design report</td>
</tr>
<tr>
<td>An innovation submission can be awarded up to 10 points as follows:</td>
<td>Innovation report</td>
</tr>
<tr>
<td>- Up to 10 initiatives can be submitted.</td>
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<tr>
<td>- Each verified initiative will be awarded one point unless it is a 1st in that Country (3 pts), World 1st (5 pts), or indicated otherwise elsewhere.</td>
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<tr>
<td>- Each initiative must meet one or more of the following five criteria:</td>
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<tr>
<td>1. innovative technology or process</td>
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<tr>
<td>2. market transformation</td>
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<td>3. improving on credit benchmarks</td>
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<td>4. innovation challenge</td>
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<td>5. global sustainability</td>
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</table>

**Additional guidance**

**General**
Initiatives must meet the following criteria, as a minimum:

- Address a valid economic, environmental or social concern.
- Be quantifiable and capable of being assessed without subjective interpretation.
- Be related to the design, construction and/or operation of infrastructure.

Innovation(s) must have been implemented to achieve any score under this credit i.e. an initiative investigated but not implemented will not achieve a score.

In reviewing the submission, the verifiers and ISCA will consider the sustainability benefit of the innovative initiative relative to existing IS rating tool credits where relevant. Information provided within the submission may be used to review the existing credits and/or develop new credits.

Up to ten initiatives can be submitted for the available 10 points in this category. No more than ten initiatives per project will be reviewed. Projects will be assessed against the innovation guidance current at the time of their registration. Project teams can submit a credit interpretation request (CIR) to receive advice on whether an initiative can be considered innovative or not under this credit.

Innovation points are reviewed by the Verifiers, but awarded entirely at the discretion of ISCA.

The different credit criteria are described below.

**Innovative Technology or Process**
The project meets the aims of an existing credit using a technology or process that is considered innovative in that region or the world.

The initiative must be a process, method and/or technology that is considered a ‘first’ in that Country (3 points) or in the world (5 points) and demonstrates exceptional sustainability performance.

Examples of initiatives may include, but are not limited to:

- Site-wide infrastructure systems.
- Workshop/engagement processes.
- Software programs to aid in sustainability performance.
- Partnership and other arrangements and mechanisms that deliver sustainability outcomes.

To demonstrate compliance against this criterion it is essential that the submission is able to prove that the innovation is a Country or a world first.

**Market Transformation**

The initiative substantially contributes to the broader market transformation towards sustainable development in that region or in the world. The innovation needs to transform the market, and result in new ways of approaching, applying or achieving sustainable outcomes. Whilst the innovation may not be necessarily new, the way it is applied in the market may be.

An example of an initiative that complies with this criterion is developing a product to comply with an IS rating tool requirement that was previously unavailable in the market.

**Improving on Credit Benchmarks**

To claim this innovation credit criterion, the project must demonstrate a substantial improvement to a specific benchmark (environment, social, economic), addressed by an existing IS credit which the project is targeting. As a guide, the credit top Level benchmark would need to be exceeded by at least a similar magnitude as the performance increment between Level 2 and Level 3. This approach can apply to both scaled and non-scaled credits although it is recognised that it may be easier to demonstrate and quantify a substantial improvement for scaled credits.

**Small Projects**

Some credits provide guidance that allows a streamlined approach for small projects, whereby some criteria are removed. In these cases, a small project may be able to achieve a substantial improvement on the top Level small project benchmark by achieving the original (‘large project’) top Level benchmark.

**Innovation Challenge**

To claim innovation under this criterion, the innovation must address an issue that is not included within the current IS rating tool. This may be done in two ways:

1. **New Innovation Challenge**
   The innovation addresses an issue not included within any of the credits in the existing IS rating tool or an existing Innovation Challenge. In this case, the project team develops an Innovation Challenge with ISCA and demonstrates compliance with the Innovation Challenge. Innovation Challenges will be made public and available to other project teams for them to comply with.

2. **Current Innovation Challenge**
   Compliance is demonstrated with any of the IS Innovation Challenges listed on the ISCA website. These challenges have been designed to challenge infrastructure owners, developers, contractors and project teams to push the bar higher and to experiment.

For more information on applying for new Innovation Challenges and a list of existing Innovation Challenges, refer to the Innovation section of the ISCA website.

**Global Sustainability**

To claim innovation under this criterion, the innovation must demonstrate compliance with an approved credit from another ISCA approved rating tool that covers a sustainability topic that is not included in this IS rating tool. A full list of credits from other ISCA approved rating tools, is available on the ISCA Website.

**Evidence**

An innovation submission must be a concise report that clearly articulates the nature and magnitude of the benefits achieved by proposed initiative(s). The report must clearly justify (and quantify whenever relevant) the environmental, social, and/or economic benefits of the initiative. Submissions that are purely qualitative and/or unsupported by documented data will not be awarded Innovation points.
The innovation report (or similar) should clearly articulate the nature and magnitude of the sustainability benefit achieved by the proposed initiative(s). Data should be provided to justify assertions made as to the particular benchmark criteria achieved. The submission may cover a single innovation or multiple innovations, but all innovations should meet the credit criteria.

In regard to firsts, while supplier statements are useful pieces of evidence, these could be made stronger by other supporting evidence such as:

- A letter from the relevant peak body or a supplier/product peak body.
- Patents.
- Relevant research acknowledgements or peer-reviewed publications.
- Awards won by the innovation.