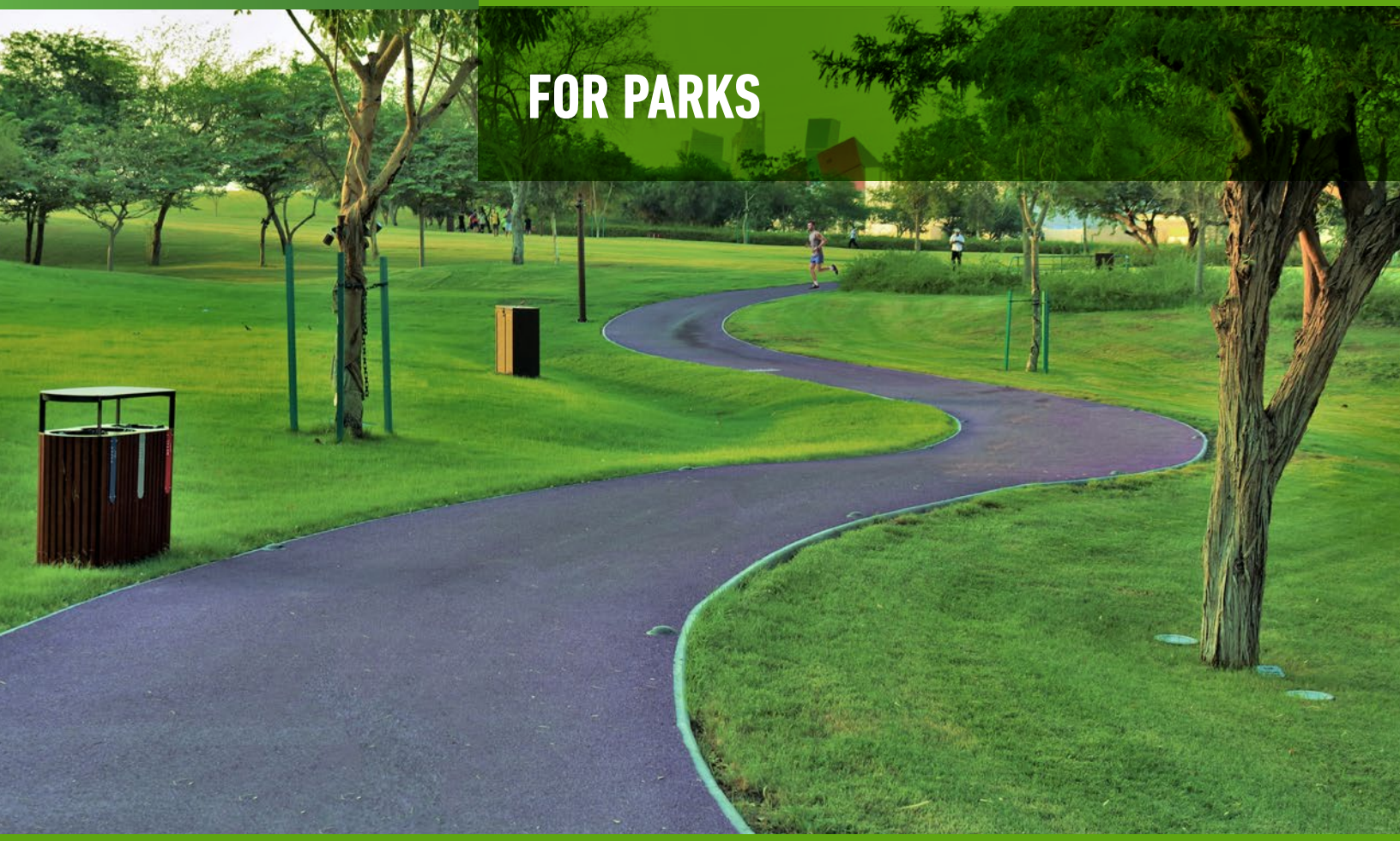
GSAS
DESIGN & BUILD
ASSESSMENT MANUAL

Building Sustainably

FOR PARKS



Dr. Yousef Alhorr, Founding Chairman

4th Edition

GORD
المنظمة الخليجية للبحث والتطوير
GULF ORGANISATION FOR RESEARCH & DEVELOPMENT

اللجنة العليا للمشاريع والإرث
Supreme Committee for Delivery & Legacy

GSAS
PUBLICATIONS SERIES

GSAS DESIGN & BUILD: ASSESSMENT MANUAL FOR PARKS

4th Edition

Dr. Yousef Mohammed Alhorr
Founding Chairman

Supported by:

اللجنة العليا للمشاريع والإرث
Supreme Committee for Delivery & Legacy

GORD
المنظمة الخليجية للبحث والتطوير
GULF ORGANISATION FOR RESEARCH & DEVELOPMENT

GSAS 2007

DISCLAIMER

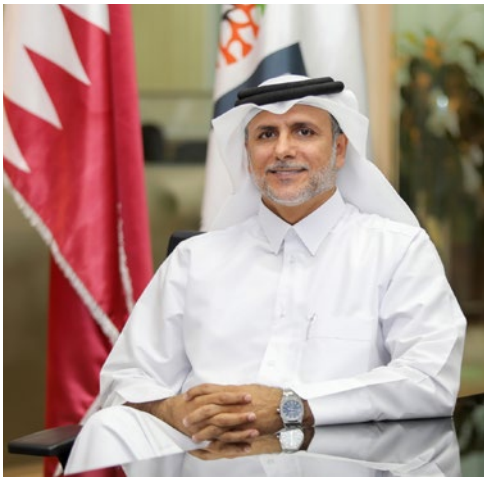
GSAS was prepared with the assistance and participation of many individuals and representatives from various organizations and the final outcome represents a general consensus. Unanimous support from each and every organization and individual consulted is not implied. GSAS documentation is revised on a regular basis and as deemed necessary. GORD, through the Center of Excellence GSAS Trust, reserves the right to amend, update and change this manual periodically without prior notice. Where changes in regulations necessitate changes to the criteria assessment, notifications will be issued to all parties involved in the assessment and will be announced on GORD website at www.gord.qa. An appropriate transition period shall be allowed for projects undergoing the assessment process.

As a condition of use, users covenant not to sue, and agree to waive and release GSAS Trust and its members from any and all claims, demands and causes of actions for any injuries, losses and damages that users may now or hereafter have as a result of the use of this manual, or reliance on GSAS.

TABLE OF CONTENTS

A MESSAGE FROM

Founding Chairman



The UN Urbanization Prospects Report 2014 states that 54% of the world's population is residing in urban areas, and by 2050, 66% is predicted to be urbanized. Continued population growth and urbanization are projected to add a further 2.5 billion people to the urban population of the world by 2050.

To put this urbanization issue into a GCC context, close to 90% of the population in Gulf countries will be in cities by 2050.

Cities are the hub of human life. It is critical to ensure that while we focus on the comforts of living, the cities remain sustainable, resilient and low-carbon. Sustainability is a way of life, which apart from reducing the environmental, social and economic burden, also determines the quality of life and how human wellbeing is taken care of. As most of our time is spent in buildings using associated infrastructure, they are the most common denominators that determine how sustainable the cities are and can be. Worldwide, regional and international organizations are tirelessly working and cooperating to make cities better places to live with a special focus on the built environment.

Out of a deep concern on unsustainable urban living – especially in the Central and Western Asian continent –in 2007, GORD developed and implemented the green building and infrastructure certification system. This initiative recognizes the pioneering efforts of the developers, contractors, practitioners and the entire construction community that has assumed responsibility to care for the cause of sustainability. GORD has come a long way since stewarding the Global Sustainability Assessment System (GSAS), formerly known as (QSAS), the Middle East's first integrated and performance-based assessment system. Our mission is to encourage the development and implementation of sustainability principles and imperatives, which stems from our vision for sustainable development regionally as well as globally. Over the last few years, we have established a clear link of what we are doing in GSAS with the achievement on multiple Sustainable Development Goals of the United Nations. GSAS draws from top-tier global sustainability systems and adds new facets and dimensions to the current practices in assessing the sustainability of the built environment. Over the years, GSAS has become one of the most comprehensive systems to date, that addresses the built environment from a macro level to a micro level, targeting a wide range of building typologies and infrastructure projects.

GSAS Certifications now cover all the dimensions to assess and certify the sustainability of the built environment, be it design, construction or operation of projects. This performance based dynamic system, equipped with ever updated benchmarks and best practices, is a great tool in the hands of the building community to continually improve the sustainability standards of the built environment.

I would like to acknowledge the efforts and contributions from the State of Qatar, all our members, international partners and the associated consultants who helped in establishing the system and taking it to new horizons Finally, the continuous support from Qatari Diar Real Estate Company (QD) and the Supreme Committee for Delivery & Legacy (SC) are highly appreciated, and without their support, GSAS would not be able to achieve what it has done in such a short span of time.

DR. YOUSEF MOHAMMED ALHORR,
FOUNDING CHAIRMAN

ACKNOWLEDGMENT

FOUNDER & LEADER FOR GSAS PROGRAM

Dr. Yousef Mohammed Alhorr,
Founding Chairman,
Gulf Organisation for Research and Development - QSTP

SPECIAL ACKNOWLEDGMENT

- HE. Ghanim Bin Saad Al-Saad
  Former Chairman and Managing Director, Barwa Real Estate Group, State of Qatar
- Eng. Mohammed Al-hedfa,
  Former GCEO, Qatari Diar Real Estate Investment Company, State of Qatar
- Dr. Mohammed Saif Al-kuwari,
  Former President, Qatar General Organization for Standards and Metrology, State of Qatar
- HE. Eng. Hilal Jeham Al-Kuwari
  Chairman, Technical Delivery Office, Supreme Committee for Delivery & Legacy

DEVELOPMENT & SUPPORT

Technical & Administration Support Teams,
Gulf Organisation for Research & Development,
Qatar Science & Technology Park, State of Qatar

PRINCIPAL PROJECT DIRECTOR (2007-2011)

Dr. Ali Malkawi
Professor of Architecture and Chairman of the Graduate Group,
University of Pennsylvania, USA

TECHNICAL LEAD (2007-2011)

Dr. Godfried Augenbroe,
Chair of Building Technology, Doctoral Program,
Professor, College of Architecture - Georgia Institute of Technology, USA

DEVELOPMENT INSTITUTIONS (2007-2011)

- University of Pennsylvania, USA
- Georgia Institute of Technology, USA

QATARI GOVERNMENT AND SEMI-GOVERNMENT ENTITIES

- Aspire Zone Foundation (ASPIRE)
- Barwa Real Estate Group (BARWA)
- Cultural Village Foundation (KATARA)
- Economic Zones Company (MANATEQ)
- New Port Project Steering Committee
- Lusail Real Estate Development Company (LUSAIL)
- Ministry of Culture & Sports (MCS)
- Ministry of Endowment and Islamic Affairs (AWQAF)
- Ministry of Interior - Internal Security Forces (ISF)
- Ministry of Municipality & Environment (MME)
- Mwani Qatar
- Private Engineering Office – Amiri Diwan (PEO)
- Public Works Authority (ASHGHAL)
- Qatar Foundation (QF)
- Qatar General Electricity and Water (KAHRAMAA)
- Qatar General Organization for Standards and Metrology (QGOSM)
- Qatar Museums (QM)
- Qatar Olympic Committee (QOC)
- Qatar Petroleum (QP)
- Qatar Rail (QR)
- Qatar Science and Technology Park (QSTP)
- Qatar University (QU)
- Qatari Diar Real Estate Investment Company (QD)
- Supreme Committee for Delivery & Legacy (SC)

INTERNATIONAL EXPERT REVIEWERS AND CONSULTANTS (2007-2011)

- Dick Van Dijk, PhD [Netherlands]
  Member of ISO TC163 Energy Standardization Committee, TNO, Institute of Applied Physics.
- Frank Matero, PhD [US]
  Professor of Architecture and Historic Preservation, University of Pennsylvania.
- Greg Foliente, PhD [Australia]
  Principal Research Scientist, CSIRO (Commonwealth Scientific and Industrial Research Organisation) Sustainable Ecosystems.
- John Hogan, PE, AIA [US]
  City of Seattle Department of Planning and Development, Member of ASHRAE.
- Laurie Olin, RLA, ALSA [US]
  Partner, OLIN Studio.
- Mark Standen [UK]
  Building Research Establishment Environmental Assessment Method (BREEAM) Technical work.
- Matthew Bacon, PhD, RIBA, FRSA [UK]
  Professor, University Salford - Faculty Built Environment and Business Informatics; Chief Executive, Conclude Consultancy Limited; and Partner, Eleven Informatics LLP.
- Matt Dolf [Canada]
  Assistant Director, AISTS (International Academy of Sports Science and Technology).
- Matthew Janssen [Australia]
  Director of Construction and Infrastructure and Environmental Management Services Business Units (KMH Environmental); formerly the Sustainability Program Manager for Skanska.
- Muscoe Martin, AIA [US]
  Director, Sustainable Buildings Industries Council (SBIC), USGBC board member.
- Nils Larsson [Canada]
  Executive Director of the International Initiative for a Sustainable Built Environment (iiSBE).
- Raymond Cole, PhD [Canada]
  Director, School of Architecture and Landscape Architecture, University of British Columbia.
- Skip Graffam, PhD, RLA, ASLA [US]
  Partner, Director of Research, OLIN Studio.
- Sue Riddlestone [UK]
  Executive Director & Co-Founder of BioRegional, Co-Director of One Planet and M.D. of BioRegional MiniMills Ltd.

PREFACE

Global Sustainability Assessment System (GSAS) is the first performance-based system in the Middle East and North Africa (MENA) region, developed for assessing and rating the buildings and infrastructures for their sustainability impacts. The primary objective of GSAS is to create a sustainable built environment that minimizes ecological impact and reduces resources consumption while addressing the local needs and environmental conditions specific to the region. GSAS adopts an integrated lifecycle approach for the assessment of the built environment including design, construction and operation phases.

The 4th Edition of GSAS launched in 2019 has capitalized on 10 years of experience and 'hands-on' implementation of GSAS, richness and capacity gained from the assessment of numerous and various building typologies totaling more than 217,000,000 square feet of built-up area and more than 1,872,000,000 square feet of district masterplanning, and multi-disciplinary research projects conducted in collaboration with renowned world-class institutes on various aspects of sustainability in the built environment.

GSAS supports the project stakeholders with manuals and tools to aid projects in the implementation of the certification processes throughout the various phases of project development from pre-design to post-occupancy.

The purpose of this manual is to provide projects with guidance and instructions on the assessment approach established by GSAS Trust to meet GSAS certification requirements for parks. The manual offers valuable information on the requirements for assessing all criteria and describes the protocols and particulars for the evaluation of each criterion. The particulars include testing, reports, plans, simulations, calculators, and how to achieve the criterion levels. In addition, the manual lists the type and description of the supporting materials that the project needs to submit to demonstrate compliance.

Most sustainable design principles and practices are relevant for all types of parks projects. However, there are circumstances in which different park types require unique measurements and assessments to accurately evaluate the environmental impact, most commonly as a result of the scale of the project. Therefore, GSAS Parks makes provision for the assessment of various scales of project from starting from Mini Parks assessment, ending with Regional Parks assessment. The area of a specific park project defines the performance factors most applicable to be considered.

This manual should be read in conjunction with all other relevant GSAS manuals and publications.

CRITERIA SUMMARY

The table below summarizes the weights of GSAS Design & Build criteria and incentives for Parks scheme:

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
UC	**URBAN CONNECTIVITY**				
UC.1	Proximity to Infrastructure	0	3	2.36%	-
UC.2	Neighborhood Connectivity	0	3	0.82%	-
UC.3	Load on Local Traffic Conditions	0	3	1.04%	-
UC.4	Public Transportation	0	3	2.41%	-
UC.5	Green Transportation	0	3	1.37%	-
			Total	**8.00%**	**0.00%**

S	SITE				
S.1	Land Preservation	-1	3	2.96%	-
S.2	Waterbody Preservation	-1	3	2.28%	-
S.3	Biodiversity Preservation	-1	3	2.85%	-
S.4	Vegetation	-1	3	2.92%	-
S.5	Drain & Stormwater Contamination	-1	3	1.93%	-
S.6	Desertification	-1	3	2.48%	-
S.7	Heat Island Effect	-1	3	1.45%	-
S.8	Shading	-1	3	1.71%	-
S.9	Accessibility	-1	3	2.45%	-
S.10	External Lighting	-1	3	1.02%	-
S.11	Walkability	-1	3	1.45%	-
S.12	Bikeability	-1	3	1.65%	-
S.13	Construction Practices	-1	3	2.85%	10.00%
			Total	**28.00%**	**10.00%**

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
E	**ENERGY**				
E.2	Energy Use Performance	-1	3	7.36%	-
E.3	Primary Energy Performance	-1	3	4.83%	-
E.4	CO_2 Emissions	-1	3	4.81%	-
E.5	Energy Sub-Metering	0	3	-	2.00%
E.6	Renewable Energy	0	3	-	2.00%
			Total	**17.00%**	**4.00%**
W	**WATER**				
W.1	Water Demand Performance	-1	3	8.00%	-
W.2	Water Reuse Performance	-1	3	14.00%	-
W.3	Water Sub-Metering	0	3	-	2.00%
			Total	**22.00%**	**2.00%**
M	**MATERIALS**				
M.1	Locally Sourced Materials	-1	3	1.30%	-
M.2	Materials Eco-Labeling	-1	3	2.30%	2.00%
M.3	Recycled Content of Materials	-1	3	1.90%	-
M.4	Materials Reuse	-1	3	1.05%	-
M.5	Cut & Fill Optimization	-1	3	0.70%	-
M.6	Design for Disassembly	-1	3	0.75%	-
M.7	Responsible Sourcing of Materials	0	3	-	1.00%
			Total	**8.00%**	**3.00%**
CE	**CULTURAL & ECONOMIC VALUE**				
CE.1	Heritage & Cultural Identity	-1	3	1.62%	-
CE.2	Support of National Economy	-1	3	2.38%	-
			Total	**4.00%**	**0.00%**

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
MO	**MANAGEMENT & OPERATIONS**				
MO.1	Systems Commissioning	0	3	0.92%	2.00%
MO.2	Waste Management	0	3	3.95%	2.00%
MO.3	Facility Management	0	3	1.23%	2.00%
MO.4	Leak Detection Systems	0	3	0.49%	-
MO.5	Safety & Security	0	3	1.92%	-
MO.6	Landscape Maintenance	0	3	1.81%	-
MO.7	Sustainability Awareness	0	3	2.68%	-
			Total	**13.00%**	**6.00%**

STRUCTURE OF ASSESSMENT

The table below summarizes elements of the assessment for each criterion in GSAS Design & Build for Parks certification:

PURPOSE	Outlines the objective of the Criterion.
ASSESSMENT PRINCIPLES	Summarizes the overall principle of the Criterion for assessment.
ASSESSMENT	Describes the requirements for assessing the Criterion.
CRITERION LEVELS	Lists the Levels associated with the indicators and compliance requirements of the Criterion.
SUBMITTALS	Lists the types and descriptions of the supporting materials that the project needs to submit to demonstrate compliance.
EVALUATION	Describes the general instruction and particulars for the evaluation of the Criterion. The particulars include testing, reports, plans, simulations, calculators, and how to achieve the criterion levels.

1.0 URBAN CONNECTIVITY

The Urban Connectivity [UC] category is concerned with the design of the proposed development having a direct impact on adjacent buildings, properties, neighborhoods and the larger urban community.

Sustainable urban practices improve the development of neighborhoods and communities, in addition to minimizing the impacts on the surrounding environment including; climate change, fossil fuel depletion, water depletion and pollution, air pollution, land use and contamination, and human comfort and health.

CRITERIA IN URBAN CONNECTIVITY CATEGORY:

UC.1 Proximity to Infrastructure

UC.2 Neighborhood Connectivity

UC.3 Load on Local Traffic Conditions

UC.4 Public Transportation

UC.5 Green Transportation

CRITERIA SUMMARY

The table below summarizes the weights of the Urban Connectivity category and each of the associated criteria:

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
UC	**URBAN CONNECTIVITY**				
UC.1	Proximity to Infrastructure	0	3	2.36%	-
UC.2	Neighborhood Connectivity	0	3	0.82%	-
UC.3	Load on Local Traffic Conditions	0	3	1.04%	-
UC.4	Public Transportation	0	3	2.41%	-
UC.5	Green Transportation	0	3	1.37%	-
			Total	**8.00%**	**0.00%**

1.1 [UC.1] PROXIMITY TO INFRASTRUCTURE

1.1.1 PURPOSE

To minimize the amount of new infrastructure required by the park.

1.1.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the existing or planned infrastructure network connections required to serve the needs of the park.
- The Project will complete the ***calculator*** for UC.1 Proximity to Infrastructure to establish the ***criterion level***.

1.1.3 ASSESSMENT

The criterion requires ***assessing*** the connections to the primary and secondary infrastructure networks within the vicinity of the park. Examples of primary infrastructure networks that support the basic needs of park uses are: electricity, water, sewer and stormwater drainage, transportation, and communication networks. Examples of secondary infrastructure networks that enhance the level of comfort and quality of life are the internet and other utility connections. The assessment considers the connections to these networks to be 'available' based on the condition that the infrastructures are present on-site or at a neighboring site within 1 km and with sufficient capacities to support the infrastructure load of the park. The assessment considers the connections to planned infrastructures on the condition that the infrastructures are to be made available within 5 years from the completion of the park based on the evidence obtained from the infrastructure providers.

The ***calculator*** determines the indicator based on the number of primary and secondary networks, wherein numeric values of (1, 0.5, 0) are assigned to each type of infrastructure when network connections are available, planned, or not available.

The ***criterion level*** is established based on the result of the indicator for UC.1 Proximity to Infrastructure.

1.1.4 CRITERION LEVELS

Levels	Primary Infrastructure Networks (X) Indicator Secondary Infrastructure Networks (Y) Indicator
0	X < 4.5
1	X ≥ 5.5 AND Y < 4
2	X ≥ 5.5 AND Y = 4
3	X ≥ 5.5 AND Y > 4

1.1.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	List of primary and secondary infrastructure networks at site.
	Relevant infrastructure drawings and specifications showing the tie-in connections to the park.
	Specifications and other applicable documents demonstrating the required infrastructure has the capacity to support the additional load of the proposed park.
Calculator	UC.1 Proximity to Infrastructure Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	As-built drawings showing tie-in connections to the park.
	When applicable, updated specifications and other applicable documents demonstrating the required infrastructure has the capacity to support the additional load of the proposed park.
Calculator	Updated UC.1 Proximity to Infrastructure Calculator.

1.1.6 EVALUATION

1.1.6.1 General

- Identify all the types of infrastructure required to support the basic needs of the park.
- Determine if the connections for the enumerated infrastructure networks in the calculator are not available, available, or planned.
- Obtain specifications and documentation to determine if the type of infrastructure required has sufficient capacity to support the infrastructure load of the park.
- Input the data into the calculator for UC.1 Proximity to Infrastructure to determine the primary and secondary infrastructure performance indicators.
- Prepare all applicable documentation.

1.1.6.2 Calculator

A. Inputs

Part 1 – Primary Infrastructure Inputs

- Primary Networks Status: Select from the pulldown menu the status of the primary infrastructure networks.

Part 2 – Secondary Infrastructure Inputs

- Secondary Networks Status: Select from the pulldown menu the status of the secondary infrastructure networks.
- Use the blank green cells with the description Others, to add secondary infrastructure networks in the park not listed in the calculator.

B. Calculations

- (X) = calculated value based on the total number of available primary networks plus 50% of the total number of the planned primary networks.
- (Y) = calculated value based on the total number of available secondary networks.
- UC.1 criterion level = the generated criterion level for UC.1 Proximity to Infrastructure based on the specified range from the criterion levels.

1.2 [UC.2] NEIGHBORHOOD CONNECTIVITY

1.2.1 PURPOSE

To allocate parks to best serve intended users within the neighborhood and surrounding areas.

1.2.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the density of the surrounding urban area and park's proximity to its users.
- The Project will complete the ***calculator*** for UC.2 Neighborhood Connectivity to establish the ***criterion level***.

1.2.3 ASSESSMENT

The criterion requires ***assessing*** the number of users within proximity to the park in comparison to the number of average daily users the park is intended to serve. Users proximity is represented by distance ranges based on the scale and type of the park. Distance ranges are represented by offset of park boundaries with associated distance. Distance ranges are 400 meters for mini parks, 800 meters for neighborhood parks, 3200 meters for community parks, 4800 meters for metropolitan parks and 12 kilometers for regional parks. The number of average daily users the park is intended to serve is calculated based on the area and the type of the park.

The ***calculator*** determines Neighborhood Connectivity Indicator based on the ratio between the actual number of users reside in proximity to the park represented by the distance range, and the number of users the park is intended to serve.

The ***criterion level*** is established based on the results of the indicators for UC.2 Neighborhood Connectivity.

1.2.4 CRITERION LEVELS

Levels	Neighborhood Connectivity Indicator (X) Indicator
0	$X < 0.7$
1	$0.7 \leq X < 0.9$
2	$0.9 \leq X < 1$
3	$X \geq 1$

1.2.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Basis of calculation related to the number of users actually resides within the distances required in the assessment.
	Sitemap identifying all the surrounding urban area within the distance ranges.
Calculator	UC.2 Neighborhood Connectivity Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
Calculator	Updated UC.2 Neighborhood Connectivity Calculator.

1.2.6 EVALUATION

1.2.6.1 General

- Indicate the type of park under assessment. This will determine the various metrics used for calculation purposes, including: typical area (m^2) per person, typical number of users and distance range (m).
- Use a site map to determine the potential number of users within the specified distance ranges based on the type of park.
- Input the data into the calculator for UC.2 Neighborhood Connectivity to determine the performance indicator.
- Prepare all applicable documentation.

1.2.6.2 Calculator

A. Inputs

- Input the total area of the park.
- Input the number of potential users within the given distance range, calculated by assessing the type and diversity of properties within the immediate neighborhood.

B. Calculations

- (X) = calculated value based on the anticipated and actual potential users derived from the total area and type of park.
- UC.2 criterion level = the generated criterion level for UC.2 Neighborhood Connectivity based on the specified ranges from the criterion levels.

1.3 [UC.3] LOAD ON LOCAL TRAFFIC CONDITIONS

1.3.1 PURPOSE

To minimize the impact of the park on the local traffic conditions.

1.3.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the traffic delay caused by the park at nearby intersection of major roadways.
- The Project will complete the ***calculator*** for UC.3 Load on Local Traffic Conditions or prepare a traffic impact study ***report*** to determine the traffic delays caused by the new park and to establish the ***criterion level***.

1.3.3 ASSESSMENT

The criterion requires ***assessing*** the increment of traffic delay caused by the new park at major roadways and intersections leading to the site. The new park demand for additional traffic, entering and leaving the park, which could result in an increase in the traffic delay at the intersection of the major roadways. The assessment considers the increase of traffic of delay as the parameter to establish the criterion level. Increase of traffic delay means the difference between traffic delays calculated at the post-development and pre-development scenarios. The assessment considers traffic delays in the worst traffic conditions, the morning and afternoon peak hours based on weekend days scenarios.

There are two options to demonstrate the increment of traffic delays caused by the park:

- **Option 1** is to use the UC.3 Load on Local Traffic Conditions calculator.
- **Option 2** is to prepare a traffic impact study report.

The ***calculator*** in Option 1 determines the indicator based on the maximum increase in traffic delay from pre- and post-development analyses of the traffic conditions at the site.

The traffic impact study ***report*** in Option 2 demonstrates the following requirements:

- An analysis of the existing traffic conditions indicating the traffic volume and flow directions in the roadways leading to the project site.
- The calculations of the traffic delay during the specified morning and afternoon peak hours for pre- and post-development conditions.
- The strategies to mitigate the impact of increased delays due to the additional traffic load.

- The revised calculations of the traffic delay during the specified morning and afternoon peak hours for post-development condition due to the implementation of the recommended strategies.
- All applicable documentation as outlined in the submittals section of the assessment.

The ***criterion level*** is established based on the result of the increase of traffic delay indicator, whether calculated through a traffic impact study report or the UC.3 Load on Local Traffic Conditions calculator.

1.3.4 CRITERION LEVELS

Levels	Maximum Increase in Traffic Delay, in minutes (X) Indicator
0	$X > 6$
1	$4 < X \leq 6$
2	$2 < X \leq 4$
3	$X \leq 2$

1.3.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Site drawings showing the building layout and adjacent road networks.
	Sitemap identifying the major roadways and intersections leading to the park.
	Specifications and other applicable documents showing the traffic flow directions and volumes of traffic for pre- and post-development conditions.
	Traffic Impact Study Report when submitting for Option 2.
Calculator	UC.3 Load on Local Traffic Calculator when submitting for Option 1.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
Calculator	Updated UC.3 Load on Local Traffic Calculator when submitting for Option 1.

1.3.6 EVALUATION

1.3.6.1 General

Option 1 - Using the calculator for UC.3 Load on Local Traffic Conditions tocalculate the traffic delay.

- Create site drawings to include the building layout and all the existing roadways that have access to the site or are related to the site's access.
- Determine from the sitemap the major roadways and intersections leading to the site by considering only the major roadways and studying one intersection only per major roadway for a maximum of three roadways.
- Determine the number of visitors to the park.
- Obtain existing traffic volumes at AM peak hour and PM peak hour at the intersections under study. Obtain the data from the local authorities or from an on-site survey.
- In the case of traffic light intersections, obtain the existing geometry (number and type of lanes, lanes width) and the green phases and total cycle timings during the AM and PM peak hours.
- Input the data into the calculator for UC.3 Load on Local Traffic Conditions to determine the effect from the additional traffic load that a new project imposes on the major adjacent arterials or roadways.
- Prepare all applicable documentation.

Option 2 - Preparing a traffic impact study report to determine the traffic delay.

1.3.6.2 Calculator

A. Inputs

Part 1 – Project Data Inputs

- Assessed Intersections Inputs
  - Input the number of roundabouts to be analyzed.
  - Input the number of traffic light intersections to be analyzed.
- Trips Generation Inputs
  - Select from the pulldown menu the type of park.
  - Input the total number of visitors.

Part 2 – Roundabouts Inputs

- Pre-Development Inputs
  - Input the name of the roadway(s) to be studied.
  - Select from the pulldown menu the type of roundabout to be studied.
  - Input the volume of traffic entering the roundabout in the Approach A direction.
  - Input the volume of traffic entering the roundabout in the conflicting directions to Approach A.
  - For Approach B inputs, follow Approach A from above.
- -Post-Development Inputs
  - Select from the pulldown menu the type of roundabout in the post-development stage.
  - Input the distribution of park loads to incoming flows.
  - Select from the pulldown menu the flow or conflicting flows of Approach A that match the incoming additional flows.
  - Input the distribution of park loads to exiting flows.
  - Select from the pulldown menu the flow or conflicting flows of Approach A that match the exiting additional flows.
  - For Approach B inputs, follow the Approach A from above.

Part 3 – Traffic Lights Inputs

- Pre-Development Inputs
  - Input the name of the roadway to be studied.
  - Select Lane Groups A and B as the two maximum flows among the 6 incoming and exiting flows of the park.
  - Input the number of lanes in Lane Group A.
  - Input the lane width of Lane Group A.
  - Select from the pulldown menu the direction of Lane Group A.
  - Input the duration of the green phase in Lane Group A for the specified peak hours.
  - Input the total duration of the cycles of the traffic lights in the intersection during the specified peak hours.

- Input the volume of traffic entering the Lane Group A for the specified peak hours.
- For Lane Group B inputs, follow the Lane Group A from above.

- Post-Development Inputs
  - Input the distribution of park loads to Lane Group A incoming and exiting flows.
  - For Lane Group B inputs, follow the Lane Group A from above.

B. Calculations

Part 1 - Project Data Calculations

- Total number of assessed intersections = calculated value based on the number of roundabouts and traffic light intersections.
- Additional traffic loads of the total, incoming, and exiting flows = calculated value for the specified morning and afternoon peak hours.

Part 2 - Roundabouts Calculations

- Pre-Development Calculations
  - Pre-development traffic delay time for Approach A and Approach B for peak hour.

- Post-Development Calculations
  - The calculator computes the post-development traffic delay time for Approach A and Approach B per peak hour.
  - The calculator computes the increase in traffic delay time for Approach A and Approach B per peak hour.

Part 3 – Traffic Lights Calculations

- Pre-Development Calculations
  - Pre-development traffic delay for Lane Groups A and B per peak hour.
- Post-Development Calculations
  - Post-development traffic delay for Lane Groups A and B per peak hour.
  - Increase in traffic delay for Lane Groups A and B per peak hour.

Part 4 – Summary Calculations

- (X) = calculated value based on the maximum increase in traffic delay, in minutes, from pre- and post-development analyses of the traffic conditions at the site.
- UC.3 criterion level = the generated criterion level for UC.3 Load on Local Traffic Conditions, based on the specified range from the criterion levels.

1.4 [UC.4] PUBLIC TRANSPORTATION

1.4.1 PURPOSE

To select a site in proximity to public transportation networks.

1.4.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the availability of public transportation stops or stations within specified distance ranges.
- The Project will complete the ***calculator*** for UC.4 Public Transportation to establish the ***criterion level***.

1.4.3 ASSESSMENT

The criterion requires ***assessing*** the availability of public transportation stops or stations by counting the number of public bus stops and rail or metro stations within the specified distance ranges from the accessible entrances of the park. The specified distance ranges are within the 500m, 750m, and 1,000m distances. The existing and planned locations of the public bus stops and rail or metro stations are as shown in the official maps of the Center for Geographic Information System (CGIS) or from other official transit guide maps from the transportation planning department.

The ***calculator*** determines the indicator based on the average weighted-quantities of the public bus stops, rail or metro stations within the specified distance ranges from the site entrance.

The ***criterion level*** is established based on the result of the indicator for UC.4 Public Transportation.

1.4.4 CRITERION LEVELS

Levels	Public Transportation (X) Indicator
0	X < 2
1	2 ≤ X < 4
2	4 ≤ X < 6
3	X ≥ 6

1.4.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	List of the number of public bus stops and rail or metro stations within the distances required in the assessment.
	Sitemap identifying the locations and distances of the public transportation stops and rail or metro stations within the distances required in the assessment.
Calculator	UC.4 Public Transportation Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
Calculator	Updated UC.4 Public Transportation Calculator.

1.4.6 EVALUATION

1.4.6.1 General

- Use a site map to determine the total number of public bus stops and rail or metro stations that are within the specified actual walking distance ranges of 500m, 750m, and 1,000m. The number of bus stops includes the number of bus routes the stop serves.
- Input the quantities of the public bus stops and rail or metro stations per distance range into the calculator for UC.4 Public Transportation to determine the Public Transportation indicator.
- Prepare all applicable documentation.

1.4.6.2 Calculator

A. Inputs

- Input the quantity of the public bus stops and rail or metro stations that are within 500m, 750m, and 1,000m distances from the main entrances of the site.

B. Calculations

- Weights = fixed values (ranging from 1 to 6) assigned to give relative importance for the calculations of performance value for public bus stops and rail or metro stations that are within the specified distances.
- (X) = calculated value based on the average weighted-quantities of the public bus stops and rail or metro stations that are within the specified distance ranges from the site entrance.
- UC.4 criterion level = the generated criterion level for UC.4 Public Transportation based on the specified range from the criterion levels.

1.5 [UC.5] GREEN TRANSPORTATION

1.5.1 PURPOSE

To provide facilities supporting the use of alternative transportation modes.

1.5.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the provision, diversity and capacity of facilities that support green transportation.
- The Project will complete the ***calculator*** for UC.5 Green Transportation to establish the ***criterion level***.

1.5.3 ASSESSMENT

The criterion requires ***assessing*** the provision, diversity and capacity of facilities that support green transportation by counting the number of such facilities provided in the park. Facilities that support green transportation are: bike racks, showers, lockers or storage facility, charging stations for electric vehicles, and shuttle bus parking spaces. The diversity of the supported green transportation is based on the calculated effective types of facilities assessed in this criterion. The types of facilities are: bike racks, electric vehicle charging stations, and shuttle bus parking spaces.

The ***calculator*** determines the indicators based on the percentage of users accommodated, and the facility types provided, including the sub-requirement for bike racks of 1 shower per 1 to 8 bikes and 1 locker for each bike accommodated. Showers, changing facilities and lockers allocated for recreational and sport uses can be considered for this criterion provided they made accessible for the targeted visitors.

The ***criterion level*** is established based on the results of the indicators for UC.5 Green Transportation.

1.5.4 CRITERION LEVELS

Levels	Percentage of Users Accommodated (X) Indicator Number of Facility Types Used (Y) Indicator
0	X < 5%
1	5 ≤ X < 15%
2	15 ≤ X < 25%
3	X ≥ 25% AND Y > 1

1.5.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Transportation Plan including alternative transportation strategies.
	Relevant specifications and other applicable architectural drawings showing the types and quantities of facilities associated with green transportation including the number of users of the facilities.
Calculator	UC.5 Green Transportation Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
Calculator	Updated UC.5 Green Transportation Calculator.

1.5.6 EVALUATION

1.5.6.1 General

- Determine the total number of park users.
- Identify the types of facilities associated with green transportation. The types of facilities are as listed in the calculator for UC.5 Green Transportation.
- Determine the quantity provided for each type of facility.
- Input the quantities of the facilities into the calculator for UC.5 Green Transportation to determine the percentage of users accommodated, and the number of facility types used.
- Prepare all applicable documentation.

1.5.6.2 Calculator

A. Inputs

- Input the number of project users.
- Input the number of bike racks, shower facilities, lockers or storage facility, electric vehicle charging stations, and shuttle bus parking spaces.

B. Calculations

- Number of users accommodated per facility = fixed values (1, 3, and 20) assigned to bike racks, electric vehicle charging stations, and shuttle bus parking stations, respectively for the calculations of the total number of users accommodated by facility.
- Weights = fixed values (0.5 and 1) assigned to give relative importance for the calculations of the total number of users accommodated by each type of facilities that support green transportation.
- Number of effective facilities = calculated value based on the number of facilities for each type.
- Total number of users accommodated = calculated value based on the number of effective facilities and assigned weights for each type.
- (X) = calculated percentage of users accommodated based on the facility types used and the calculated total number of users accommodated over the total number of project users.
- (Y) = calculated value based on the number of facility types used.
- UC.5 criterion level = the generated criterion level for UC.5 Green Transportation based on the specified range from the criterion levels.

2.0 SITE

The Site category is concerned with the design of the proposed development having a direct impact on both the site of the development itself as well as any adjacent sites.

Sustainable landscaping and site design practices can improve the quality of the existing site and landscape and minimize the impacts on the surrounding environment including climate change, fossil fuel depletion, water depletion and pollution, air pollution, land use and contamination, and human comfort and health.

CRITERIA IN SITE CATEGORY:

S.1 Land Preservation

S.2 Waterbody Preservation

S.3 Biodiversity Preservation

S.4 Vegetation

S.5 Drain & Stormwater Contamination

S.6 Desertification

S.7 Heat Island Effect

S.8 Shading

S.9 Accessibility

S.10 External Lighting

S.11 Walkability

S.12 Bikeability

S.13 Construction Practices

CRITERIA SUMMARY

The table below summarizes the weights of the Site category and each of the associated criteria:

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
S	**SITE**				
S.1	Land Preservation	-1	3	2.96%	-
S.2	Waterbody Preservation	-1	3	2.28%	-
S.3	Biodiversity Preservation	-1	3	2.85%	-
S.4	Vegetation	-1	3	2.92%	-
S.5	Drain & Stormwater Contamination	-1	3	1.93%	-
S.6	Desertification	-1	3	2.48%	-
S.7	Heat Island Effect	-1	3	1.45%	-
S.8	Shading	-1	3	1.71%	-
S.9	Accessibility	-1	3	2.45%	-
S.10	External Lighting	-1	3	1.02%	-
S.11	Walkability	-1	3	1.45%	-
S.12	Bikeability	-1	3	1.65%	-
S.13	Construction Practices	-1	3	2.85%	10.00%
			Total	**28.00%**	**10.00%**

2.1 [S.1] LAND PRESERVATION

2.1.1 PURPOSE

To enhance the ecological value of the park site.

2.1.2 ASSESSMENT PRINCIPLES

- The Project will ***assess***:
  - The pre-development ecological value of the site.
  - The post-development remediation, enhancement, or preservation strategies.
- The Project will complete the ***calculator*** for S.1 Land Preservation based on the site ***testing*** and assessment ***report*** to establish the ***criterion level***.

2.1.3 ASSESSMENT

The criterion requires ***assessing*** the existing ecological value of the site by quantifying the pre- and post-development conditions of the areas of the land based on the geological and environmental testing and assessment report. The pre-development areas are the surveyed areas of the land classified to be contaminated, previously developed, has no ecological value, or with low, moderate, or high ecological value. The post-development areas are the areas of the land with or without improved classifications after applying the land remediation measures or planned enhancement strategies. Areas of the land found to be contaminated would require complete remediation before commencing the works at site. Complete remediation means that there are post-development sampling tests conducted on the remediated lands.

The geological and environmental ***testing*** of the site require sampling analyses from an accredited laboratory. The geological testing includes the investigations of the surface and subsurface soil stratification along with the geological conditions and the physical and mechanical properties of the ground materials. The environmental testing determines the presence and levels of heavy metals, hydrocarbons and their possible sources, pathways, and potential receptors.

The testing demonstrates the following requirements:

- The required geological and environmental testing of the site in accordance with the applicable standards.
- The results of the sampling analyses from an accredited laboratory.

The assessment ***report*** is the executive summary prepared by a specialist. Based on the results of the relevant testing, the specialist prepares recommendations that promotes the protection and enhancement of the natural features and environmental quality of the site without compromising

the need for development of land and built environment.

The report demonstrates the following requirements:

- Ecological Conservation - describes the strategies and measures on the conservation and management of ecologically valuable lands to prevent adverse impact on biodiversity during the development of the park.
- Site Restoration - describes the strategies and measures for restoring the previously developed or contaminated land into its original ecological state. This includes restoration of temporary construction areas and logistics into its previous condition.
- Soil Contamination - describes any potential constraints of contaminated land to the development and includes the procedures and guidelines for soil management during excavation, soil sampling, and backfilling works. Refer to BS 10175:2011+ A1:2013 Investigation of potentially contaminated sites - Code of practice or equivalent.

The ***calculator*** determines the indicator based on the improvement factors for each land classifications and the adequacy of the site assessment report including the relevant testing requirements.

The ***criterion level*** is established based on the result of the indicator for S.1 Land Preservation.

2.1.4 CRITERION LEVELS

Levels	Land Preservation (X) Indicator
-1	X ≤ 0, OR the Report does not demonstrate compliance with the requirements.
0	0.00 < X < 0.25
1	0.25 ≤ X < 0.50
2	0.50 ≤ X < 0.75
3	X ≥ 0.75

2.1.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant Landscape drawings and specifications.
	Sitemap identifying the location and vicinity of the park.
	Applicable permits from concerned authorities.
Report	Assessment Report.
Testing	Geological and Environmental Testing in accordance with the applicable standards, including the report of the results and analyses from an accredited laboratory.
Calculator	S.1 Land Preservation Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
Report	Updated Land Preservation Report, when applicable.
Testing	Post-development environmental testing.
Calculator	Updated S.1 Land Preservation Calculator.

2.1.6 EVALUATION

2.1.6.1 General

- Engage a specialist in assessing the site by evaluating the ecological value of the land's soil quality and areas of the land that are contaminated or have been previously developed.
- Conduct geological and environmental testing in accordance with the applicable standards and prepare a report of the results and analysis.
- Determine from the environmental testing report the degree of contamination and proposed strategies for remediating the sources of contamination.
- Establish from the testing the pre-development, the existing ecological value of the land.
- Prepare the post-development remediations or enhancement strategy for the land.
- Input the data into the calculator for S.1 Land Preservation to determine the improvement factor of the ecological value of the land.
- Prepare all applicable documentation and obtain relevant permits.

2.1.6.2 Calculator

A. Inputs

Part 1 – Assessment Report Inputs

- Input if there is an assessment report or executive summary of the site conditions from an Ecologist or Specialist.

Part 2 – Ecological Value Inputs

- Input the areas of land classified as contaminated, previously developed, has no ecological value, with low, moderate, and high ecological values. The ecological value of land can be described as follows:
    - **Contaminated Land:** land in which the soil/surface layer contains one or more contaminant(s) at a concentration level equal to or exceeding the intervention value identified in the new Dutch List. Where remediation only requires the removal of asbestos within an existing building, the overall site cannot be classified as 'contaminated land'.
    - **Previously Developed Land:** land that has been graded or directly altered by human activity. This might include also some buildings, roads or parking lots.
    - **No Value:** land in which the surface layer has a very limited capacity to function

as a natural substrate for plants, or land which does not contain virtually any organic matter and thus has no organic aggregates. It is dominated by large grain material (gravel) with insufficient small grain material (sand/silt/clay) to form an aggregate soil structure, with very low water retention and very low available water capacity.

- **Low Value:** land which is not located within 2km of a protected area or within 500m of a site of specific scientific interest. It does not include habitats or trees over 10 years old. It consists of poor soil structure, related to limited aggregate formation due to a high proportion of large grain material and a low volume of organic matter. It has evidences of limited/stunted plant growth.
- **Moderate Value:** land in which the surface layer can be defined as soil and fulfill most functions expected of a natural substrate. It consists of a moderate soil structure dominated by small grain aggregates with a low proportion of large grain material. It has evidences of plants growing effectively.
- **High Value:** land that has evidence of strong plant growth, contains trees or hedges above 1m in height or with a trunk diameter greater than 100 mm or mature strong trees older than 10 years. It might have ponds, streams or rivers running through the site. It may include meadows or species-rich grassland present on the site. The surface layer can be clearly defined as soil and is fulfilling all functions expected of a natural substrate.

- Input the post-development areas of the lands with and without improved classifications relative to the pre-development classifications.

B. Calculations

- Weighing factors = fixed values (-1, 0, 1, 2, and 3) assigned to give relative importance for the calculations of improvement factors for contaminated lands, lands that are previously developed, lands with no ecological value, lands with low ecological value, lands with moderate ecological value, and lands with high ecological value, respectively.
- Factors = fixed values (-1, 0, 1, 2, and 3) assigned to give relative importance for the calculations of each land classifications.
- Improvement factors = calculated values for each land classifications.
- Land Preservation indicator = calculated value based on the assessed improvements factors for each land classifications.
- (X) = calculated value based on the calculated improvement factors for each land classifications.
- S.1 criterion level = the generated criterion level for S.1 Land Preservation based on the specified range from the criterion levels.

2.2 [S.2] WATERBODY PRESERVATION

2.2.1 PURPOSE

To minimize ecological degradation of waterbodies affected by the park.

2.2.2 ASSESSMENT PRINCIPLES

- The Project will ***assess***:
  - The condition of existing waterbodies on or nearby the site.
  - The post-development conservation, restoration, or enhancement strategy.
- The Project will prepare an inspection ***report*** or waterbody preservation ***plan*** based on the site ***testing*** to establish the ***criterion level***.

2.2.3 ASSESSMENT

The criterion requires ***assessing*** the existence and quality of waterbodies on or nearby the site by preparing an inspection report or waterbody preservation plan. Waterbodies are areas that hold surface water or groundwater, including but not necessarily limited to water streams, rivers, lakes, estuaries, bays, lagoons, gulfs, and aquifers. Waterbodies on or nearby the site are existing natural bodies of water located within a 200m buffer zone around the park.

The hydrological and environmental ***testing*** of the site require sampling analyses from an accredited laboratory. The hydrological testing includes the amount and quality of water being stored or conveyed on the land surface, and in soils and rocks near the surface. The environmental testing of waterbodies determines the presence and levels of heavy metals, hydrocarbons and their possible sources, pathways, and potential receptors.

The testing demonstrates the following requirements:

- The required hydrological and environmental testing of the site in accordance with the applicable standards.
- The results of the sampling analyses from an accredited laboratory.

The inspection ***report*** is a limited scope document prepared by a specialist that demonstrates the existence of surface water and groundwater on or nearby the site. The assessment requires a report based on visual inspections and hydrological testing of the site to verify available data and record observations of the presence of surface water and groundwater.

The report demonstrates the following requirements:

- Analysis of the depth of the groundwater table and evaluates the potential of the development's impact on the groundwater over time.
- An executive summary of the inspections conducted at the site with photos demonstrating the existence of natural bodies of water on or nearby the site.

The waterbody preservation ***plan*** is a comprehensive document prepared by a specialist, which demonstrates the presence of waterbodies on or nearby the site and the remedial measures and strategies to be implemented for the protection, restoration or enhancement of existing natural bodies of water against water pollution or contamination based on the results of the relevant testing.

The plan demonstrates the following requirements:

- The potential impacts of the park on all existing natural bodies of water on or nearby the site.
- The measures and strategies to mitigate the impacts of water pollution and contamination that exceeds the limits specified by local regulations.
- The remedial measures or strategies to be implemented for waterbody conservation, coastal protection, or groundwater protection.

The ***criterion level*** is established based on the degree of compliance of the report or plan to the requirements of S.2 Waterbody Preservation.

2.2.4 CRITERION LEVELS

Levels	Requirements
-1	Report or Plan does not demonstrate compliance with the requirements.
0	Report demonstrates the non-existence of waterbodies on or nearby the site.
1	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

2.2.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Sitemap identifying the location of natural bodies of water on or nearby the park.
	Applicable permits from concerned authorities.
Testing	Hydrological and Environmental Testing in accordance with the applicable standards, including the report of the results and analyses from an accredited laboratory.
Report	Inspection Report.
Plan	Waterbody Preservation Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
Testing	Post-development environmental testing.
Plan	Updated Waterbody Preservation Plan, when applicable.

2.2.6 EVALUATION

2.2.6.1 General

- Partial compliance for this criterion is associated with the plan demonstrates there is no ecological degradation of waterbodies affected by the park.
- Full compliance for this criterion is associated with the plan demonstrates the potential impacts of the park on all existing natural bodies of water on or nearby the site, identifies the impacts that exceed the limits from local regulations, and provides measures and strategies to mitigate the impacts.
- Engage a specialist in evaluating the site for the existence and quality of waterbodies on or nearby the site.
- Conduct hydrological and environmental testing in accordance with the applicable standards and prepare a report of the results and analysis.
- Determine from the environmental testing report the potential impacts of the park to the existing natural bodies of water on nearby the site.
- Establish from the testing the remedial measures, strategies, and contamination and management plan to protect all existing natural waterbodies of water on or nearby the site.
- Prepare all applicable documentation and obtain relevant permits.

2.3 [S.3] BIODIVERSITY PRESERVATION

2.3.1 PURPOSE

To preserve and enhance the natural biodiversity of the park site.

2.3.2 ASSESSMENT PRINCIPLES

- The Project will ***assess***:
  - The plants and endangered animals within the site and adjacent areas.
  - The post-development conservation, restoration, or enhancement strategy.
- The Project will prepare a biodiversity inspection ***report*** or preservation ***plan*** to establish the ***criterion level***.

2.3.3 ASSESSMENT

The criterion requires ***assessing*** the existence of plants and endangered animals including the habitats within the site and adjacent areas. The investigated plants exclude the low-value shrubs, ground cover, and seasonal and invasive species from the analysis. When a park covers a large area, the location may impact the habitats of the endangered animals, migration or living patterns, the adjacent areas of the site are subject for analysis and evaluation. Refer to relevant documents from concerned local authorities for more information on endangered animals. The assessment includes preparing an inspection report or biodiversity preservation plan that identifies the post-development conservation, restoration, or enhancement strategies of the site's biodiversity.

The inspection ***report*** is a limited scope document prepared by a specialist that demonstrates the existence of plants and endangered animals including their habitats within the site, and where applicable, the adjacent areas. The visual inspection verifies the available data and records of observations of the site.

The report demonstrates the following requirements:

- An executive summary of the inspections conducted at the site with observations and conclusions.
- Visual evidences demonstrating the existence of plants and endangered animals, including their habitats within the site and adjacent areas.

The biodiversity preservation ***plan*** is a comprehensive document prepared by a specialist, which demonstrates the existence, enhancement, preservation, and protection of plant species and endangered animals including its natural habitats during and after construction. The plan includes identifying the types and number of plants and endangered animals and the potential of the park to damage the interaction of the ecosystem with the site and surrounding areas.

The plan demonstrates the following requirements:

- The types and number of the endangered animals.
- The types and number of the plants, excluding the low-value shrubs, groundcover, seasonal and invasive species.
- The potential impacts of the park to the ecosystem's interaction with the site and its surrounding areas.
- The measures and strategies for the enhancement, preservation, and protection of plants and endangered animals, including their habitats within the site and adjacent areas.

The ***criterion level*** is established based on the degree of compliance of the report or plan to the requirements of S.3 Biodiversity Preservation.

2.3.4 CRITERION LEVELS

Levels	Requirements
-1	Report or Plan does not demonstrate compliance with the requirements.
0	Report demonstrates the non-existence of plants or habitats of endangered animals.
1	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

2.3.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Sitemap identifying the location of plants and habitats of endangered animals within the site and adjacent areas.
	List of plants and habitats of endangered animals discovered within the site and adjacent areas.
	Applicable permits from concerned authorities.
Report	Inspection Report.
Plan	Biodiversity Preservation Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
Plan	Updated Biodiversity Preservation Plan, when applicable.

2.3.6 EVALUATION

2.3.6.1 General

- Partial compliance for this criterion is associated with the plan demonstrates preservation or enhancement of either the plants or habitats of the endangered animals.
- Full compliance for this criterion is associated with the plan establishes the inventory of the plants and endangered animals, assesses the potential impacts of the park to the ecosystem, and describes the post-development conservation, restoration, or enhancement strategies of the site's biodiversity.
- Engage a specialist in evaluating the site for the existence of plants and habitats of endangered animals.
- Determine the potential for the park to damage the ecosystem's interaction with the site and the surrounding areas.
- Determine the strategies to enhance protect or preserve plant species and endangered animals, including their habitats as a result of the development.
- Prepare all applicable documentation and obtain relevant permits.

2.4 [S.4] VEGETATION

2.4.1 PURPOSE

To vegetate the park using native, adaptive and non-toxic plant species.

2.4.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the areas of vegetation, lawn, and native plants used for soft landscaping.
- The Project will complete the ***calculator*** for S.4 Vegetation to establish the ***criterion level***.

2.4.3 ASSESSMENT

The criterion requires ***assessing*** the areas of vegetation, lawn and native plants used for landscaping by measuring the vegetated areas of the site and counting the quantities of each plant species. Vegetated areas include the outdoor soft landscapes within the boundary of the park. It consists of outdoor soft landscapes at ground, podium and roof levels cultivated with lawns and plant species. The assessment considers the growth form and the characteristics of the selected lawns and plant species. The selections for growth form are trees, shrubs, climbers, desert plants, ground covers, and grass. The selections for characteristics are native, adaptive, non-native, and edible or medicinal. The toxicity of the plant should also be determined to provide proper mitigating measures for the safety of the park users.

The ***calculator*** determines the indicators based on the following:

- Percentage of vegetated areas.
- Percentage of native or adaptive plant areas.
- Percentage of grass areas.

The ***criterion level*** is established based on the results of the indicators for S.4 Vegetation.

2.4.4 CRITERION LEVELS

2.4.4.1 Mini Parks and Neighborhood Parks

Levels	Percentage of Vegetated Areas (X) Indicator Percentage of Native and Adaptive Plant Areas (Y) Indicator Percentage of Grass Areas (Z) Indicator
-1	X < 5% OR Y < 20% OR Z > 70%
0	5% ≤ X < 10% AND 20% ≤ Y < 30%
1	10% ≤ X < 15% AND 30% ≤ Y < 40%
2	15% ≤ X < 20% AND 40% ≤ Y < 50%
3	X ≥ 20% AND Y ≥ 50%

2.4.4.2 Community Parks, Metropolitan Parks and Regional Parks

Levels	Percentage of Vegetated Areas (X) Indicator Percentage of Native and Adaptive Plant Areas (Y) Indicator Percentage of Grass Areas (Z) Indicator
-1	X < 10% OR Y < 20% OR Z > 80%
0	10% ≤ X < 15% AND 20% ≤ Y < 30%
1	15% ≤ X < 20% AND 30% ≤ Y < 40%
2	20% ≤ X < 25% AND 40% ≤ Y < 50%
3	X ≥ 25% AND Y ≥ 50%

2.4.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant landscape drawings and specifications.
	Softscape material data sheets.
Calculator	S.4 Vegetation Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
Calculator	Updated S.4 Vegetation Calculator.

2.4.6 EVALUATION

2.4.6.1 General

- Identify the total site area.
- Identify and count the number of plant species used for soft landscaping.
- Determine the types, growth form, and quantities of the lawn and plant species used for soft landscaping.
- Determine the characteristics of the plants, whether it is native, adaptive, non-native, edible, or medicinal.
- Provide mitigation measures for any invasive plant species and toxic plants.
- Determine the area covered by each plant and lawn.
- Input the data into the calculator for S.4 Vegetation to determine the factors.
- Prepare all applicable documentation.

2.4.6.2 Calculator

A. Inputs

Site Inputs

- Input the total site area of the park.

Vegetation Analysis Inputs

- Input the scientific name of the plant species used for soft landscaping.
- Select from the pulldown menu the growth form of the plant species.
- Select from the pulldown menu the plant nativity of the plant species.
- Input the quantities of each plant species.
- Input the vegetated areas covered by each plant species.

B. Calculations

- Total vegetated areas = calculated value based on the quantity and area coverage of each plant species.
- (X) = calculated value based on the percentage of vegetated areas over the total site area.
- (Y) = calculated value based on the percentage of native or adaptive plant areas over the total vegetated areas.
- (Z) = calculated value based on the percentage of grass areas over the total vegetated areas.
- S.4 criterion level = the generated criterion level for S.4 Vegetation based on the specified range from the criterion levels.

2.5 [S.5] DRAIN & STORMWATER CONTAMINATION

2.5.1 PURPOSE

To prevent the contamination of drain and stormwater discharged from the park site.

2.5.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the mitigation measures for the prevention of drain and stormwater contamination prior to discharge from the park site.
- The Project will prepare a drain and stormwater contamination ***plan*** to establish the ***criterion level***.

2.5.3 ASSESSMENT

The criterion requires ***assessing*** the mitigation measures for the prevention of drain and stormwater contamination by preparing a drain and stormwater contamination plan that identifies the collection and removal of all toxic and harmful substances from drain and stormwater before discharging into the public systems. Toxic and harmful substances include, but not necessarily limited to solids, sludge, floating debris, oil, scum, or any substances associated with the industrial process.

The drain and stormwater contamination ***plan*** demonstrates any of the following requirements:

- No presence of toxic or harmful substances in the drainage systems.
- Strategies for filtering, collecting, and treating sanitary and stormwater drains.

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of S.5 Drain and Stormwater Contamination.

2.5.4 CRITERION LEVELS

Levels	Requirements
-1	Plan does not demonstrate compliance with the requirements.
0	Plan demonstrates the non-existence of toxic or harmful substances in the drainage and stormwater systems.
3	Plan demonstrates full compliance with the requirements.

2.5.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant drainage system drawings and specifications.
	Relevant stormwater system drawings and specifications.
	Relevant tank and filtration systems drawings and specifications.
Plan	Drain & Stormwater Contamination Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
	Updated relevant specifications, where applicable
Plan	Updated Drain & Stormwater Contamination Plan, where applicable.

2.5.6 EVALUATION

2.5.6.1 General

- Full compliance for this criterion is associated with the plan demonstrates compliance with the requirements for filtration, separation, or treatment of the contaminants in the sanitary drainage and stormwater drainage systems.
- Identify from the drawings the sanitary and stormwater drainage systems of the park.
- Determine the specifications of the sanitary and stormwater drainage systems.
- Illustrate the final terminations and connection details of the sanitary and stormwater drainage systems of the park to the public systems.
- Identify the filtration, separation, collection or treatment strategies and facilities required to remove all toxic substances from drain and stormwater.
- Demonstrate the absence of toxic substances in the drain and stormwater if applicable.
- Prepare all applicable documentation.

2.6 [S.6] DESERTIFICATION

2.6.1 PURPOSE

To reverse, prevent, or minimize desertification and protect the park from sandstorms.

2.6.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the physical strategies for reversing, preventing, or minimizing desertification at the parks.
- The Project will prepare a desertification plan to establish the ***criterion level***.

2.6.3 ASSESSMENT

The criterion requires ***assessing*** the physical strategies for reversing, preventing or minimizing desertification at the parks by preparing a desertification ***plan***.

The plan demonstrates the following requirements:

- Wind data from the nearest weather station highlighting the prevailing winds on the park.
- Landscaping plans identifying all desertification strategies, landscaped zones, and wind barriers on the park.
- Diagrams and elevations demonstrating the density, height and length of wind barriers

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of S.6 Desertification.

2.6.4 CRITERION LEVELS

Levels	Requirements
-1	Plan does not demonstrate compliance with the requirements.
0	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

2.6.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant softscape and hardscape drawings and specifications.
	Relevant site plan indicating the location of any physical desertification strategies
	Relevant diagrams demonstrating the scope and specification of desertification strategies
Plan	Desertification Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
	Updated relevant specifications, where applicable
Plan	Updated Desertification Plan, where applicable.

2.6.6 EVALUATION

2.6.6.1 General

- Partial compliance for this criterion is associated with the plan demonstrates inconsequential strategies for reversing, preventing or minimizing desertification at the parks.
- Full compliance for this criterion is associated with the plan demonstrating compliance with the requirements for reversing, preventing or minimizing desertification at the parks.
- Determine the wind direction through the wind data from the nearest weather station.
- Illustrate in the landscape plan all desertification strategies, landscaped zones and wind barriers in the park.
- Illustrate the density, height and length of wind barriers through diagrams and elevations
- Prepare all applicable documentation.

2.7 [S.7] HEAT ISLAND EFFECT

2.7.1 PURPOSE

To reduce heat island effect of the park on the surrounding environment.

2.7.2 ASSESSMENT PRINCIPLES

- The Project will ***assess***:
  - The pre-development albedo value of the park site.
  - The post-development impact on the albedo value.
- The Project will complete the ***calculator*** for S.7 Heat Island Effect to establish the ***criterion level***.

2.7.3 ASSESSMENT

The criterion requires ***assessing*** the pre-development albedo value of the park site and the post-development impact of the park design on the albedo value by calculating the albedo difference between pre- and post-development albedo values. The albedo value is the ratio of solar energy reflected off a surface to incident solar energy.

The basis of calculation of the pre-development albedo value are the areas and solar reflectance values of hard and soft landscape, the areas and solar reflectance values of any roofs of existing buildings on the site.

The basis of calculation of the post-development albedo value are the areas and solar reflectance values of the proposed hard and soft landscaping within the park, and the areas and solar reflectance values of any roofs of existing or new buildings within the boundary of the park.

The ***calculator*** determines the indicator based on the albedo difference from the calculated albedo values of the pre- and post-development site conditions.

The ***criterion level*** is established based on the result of the indicator for S.7 Heat Island Effect.

2.7.4 CRITERION LEVELS

Levels	Albedo Difference (X) Indicator
-1	X < -0.3
0	-0.3 ≤ X < -0.2
1	-0.2 ≤ X < -0.1
2	-0.1 ≤ X < 0
3	X ≥ 0

2.7.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant architectural, hard and soft landscaping drawings and specifications.
Calculator	S.7 Heat Island Effect Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built architectural, hard and soft landscaping drawings and specifications.
Calculator	Updated S.7 Heat Island Effect Calculator.

2.7.6 EVALUATION

2.7.6.1 General

- Complete the Project details to indicate the type of park under assessment.
- Determine the pre-development albedo value of the park site based on the areas of reference materials provided in the calculator.
- Determine the post-development albedo value of the park site based on the areas of reference materials provided in the calculator. Where necessary additional material types, SR values and areas can be indicated.
- Input the data into the calculator for S.7 Heat Island Effect to determine the albedo values.
- Prepare all applicable documentation.

2.7.6.2 Calculator

Part 1 – Pre-Development Inputs

- Input the areas of existing materials against the available references identified in the calculator. Where necessary additional material types, SR values and areas can be indicated.

Part 2 – Post-Development Inputs

- Input the areas of proposed materials against the available references identified in the calculator. Where necessary additional material types, SR values and areas can be indicated.

A. Calculations

- (X) = calculated albedo difference based on the calculated albedo values of the pre- and post-development site conditions (post-development albedo – pre-development albedo)
- S.7 criterion level = the generated criterion level for S.7 Heat Island Effect based on the specified range from the criterion levels.

2.8 [S.8] SHADING

2.8.1 PURPOSE

To provide shading for commonly used outdoor areas.

2.8.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the area of shaded pedestrian pathways, picnic areas, parking spaces, and commonly used outdoor areas.
- The Project will complete the ***calculator*** for S.8 Shading based on the results from approved shading ***simulation*** software to establish the ***criterion level***.

2.8.3 ASSESSMENT

The criterion requires ***assessing*** the shaded areas based on the amount of shade cast on the hardscaped pedestrian pathways, parking areas, hardscape common areas and picnic & seating areas, using an approved shading ***simulation*** software. The hardscaped common areas include, but are not necessarily limited to hardscaped plazas, courtyards, and other spaces that are open and accessible to the general public.

The ***simulation*** determines the amount of shade cast on 21st of June at 15:00 hours.

The indicators calculate the percentage of shaded areas based on simulation results. If any of the indicators resulted with the calculated value falling within the range of Level (-1), the criterion receives Level (-1).

The ***calculator*** determines the indicator based on the percentage of shade cast on the following areas:

- Hardscaped pedestrian pathways and parking areas.
- Hardscaped common areas.
- Picnic and seating areas.

The ***criterion level*** is established based on the result of the indicator for S.8 Shading.

2.8.4 CRITERION LEVELS

The calculator determines the criterion level based on the averaged results of the (X), (Y) and (Z) indicators. If any of the shading indicators result in a calculated value falling within the range of Level (-1), the S.8 Shading criterion receives Level (-1).

Levels	Percentage of Shaded Hardscaped Pedestrian Pathways & Parking Areas (X) Indicator
-1	X < 60%
0	60% ≤ X < 70%
1	70% ≤ X < 80%
2	80% ≤ X < 90%
3	X ≥ 90%

Levels	Percentage of Shaded Hardscaped Common Areas (Y) Indicator
-1	Y < 25%
0	25% ≤ Y < 30%
1	30% ≤ Y < 35%
2	35% ≤ Y < 40%
3	Y ≥ 40%

Levels	Percentage of Shaded Picnic and Seating Areas (Z) Indicator
-1	Z < 25%
0	25% ≤ Z < 40%
1	40% ≤ Z < 50%
2	50% ≤ Z < 60%
3	Z ≥ 60%

2.8.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Site drawings outlining all building footprints, pedestrian pathways, parking areas, common areas.
	Site drawings outlining all building footprints, pedestrian pathways, picnic and seating areas.
	Relevant architectural and landscape drawings and specifications.
Simulation	Shading Simulation results.
Calculator	S.8 Shading Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
Simulation	Updated Shading Simulation results.
Calculator	Updated S.8 Shading Calculator.

2.8.6 EVALUATION

2.8.6.1 General

- Determine the landscape features that contribute to the shading requirements.
- • Determine the architectural features that contribute to the shading requirements. This can also include the shading contribution of any existing or proposed buildings within the boundary of the park.
- Determine from the simulation the area of the shaded hardscaped pedestrian pathways, parking, commonly used outdoor areas and picnic & seating areas.
- Input the data into the calculator for S.8 Shading to determine the percentage of shaded areas.
- Prepare all applicable documentation.

2.8.6.2 Simulation

- Use an approved simulation software to demonstrate the amount of shade cast on the hardscaped pedestrian pathways, parking areas, picnic areas and common areas on 21st of June at 15:00 hours.

2.8.6.3 Calculator

A. Inputs

Shading Cast References Inputs

- Input the nearest city representing the location of the park.

Part 1 – Percentage of Shaded Hardscaped Pedestrian Pathways & Parking Areas Inputs

- Select Yes from the pulldown menu if there are hardscaped pedestrian pathways or parking areas at the site.
- If Yes, input the total area.
- Input the shaded area based on the simulation results.

Part 2 – Percentage of Shaded Hardscaped Common Areas Inputs

- Select Yes from the pulldown menu if there are hardscaped common areas at the site.
- If Yes, input the total area.
- Input the shaded area based on the simulation results.

Part 3 – Percentage of Shaded Picnic and Seating Areas Inputs

- Select Yes from the pulldown menu if there are picnic and seating areas in the park.
- If Yes, input the total area.
- Input shaded area based on the simulation results.

B. Calculations

- Total shading cast on hardscaped pedestrian pathways and parking areas = result based on simulations.
- Total shading cast on hardscaped common areas = result based on simulations.
- Total shading cast on picnic and seating areas = result based on simulations.
- (X) = calculated percentage of shaded hardscaped pedestrian pathways and parking areas.
- (Y) = calculated percentage of shaded hardscaped common areas.
- (Z) = calculated percentage of shaded picnic and seating areas.
- S.8 criterion level = the generated criterion level for S.8 Shading based on the calculated average of (X), (Y) and (Z) indicators from the criterion levels.

2.9 [S.9] ACCESSIBILITY

2.9.1 PURPOSE

To maximize accessibility to and within the park for all users, in particular those with special needs.

2.9.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the accessible entrances of the park.
- The Project will prepare an accessibility ***plan*** to demonstrate compliance with the Architectural Barriers Act (ABA) for Outdoor Spaces and to establish the ***criterion level***.

2.9.3 ASSESSMENT

The criterion requires ***assessing*** the accessibility of the paved pathways by preparing an accessibility ***plan*** that demonstrates compliance with the Architectural Barriers Act (ABA) for outdoor spaces. The accessibility plan demonstrates all pathways are provided with adequate signage strategies at all intersections and regular intervals along an unbroken length of a pathway. Signage strategies include, but are not necessarily limited to street signage, pathway labels, trash and recycling receptacles, and directional signs leading to major attractions, parking, entrances, and exits.

The plan demonstrates the following requirements:

- Accessible entrances and paved pathways that meet the ABA guidelines for outdoor spaces.
- A wayfinding system consisting of comprehensive signage and pavement markings to safely guide users to their destinations along preferred routes.
- Signage at entrances providing clear orientation to major points of interest, such as the location of washrooms, prayer rooms, kids playgrounds, park activities and adjacent public transport.
- Safety and advisory warning signs in hazardous and potentially hazardous areas, signs indicating all public, administrative, and maintenance facilities, and interpretative signs for any historical, artistic, and cultural attractions.
- Safe connection between the park and other public areas including parking spaces, leisure areas, and recreational spaces, sitting areas...etc.

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of S.9 Accessibility.

2.9.4 CRITERION LEVELS

Levels	Requirements
-1	Plan does not demonstrate compliance with the requirements.
0	Plan demonstrates the provision of an adequate number of accessible entrances.
3	Plan demonstrates full compliance with the requirements.

2.9.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Site drawings identifying all accessible pathways to and within the park boundary to the accessible entrances.
	Relevant architectural and signage drawings and pathway material specifications.
Plan	Accessibility Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	As-built drawings identifying all accessible pathways within the park boundary to the accessible entrances.
	As-built architectural and signage drawings and specifications.
Plan	Updated Accessibility Plan, where applicable.

2.9.6 EVALUATION

2.9.6.1 General

- Determine all accessible, paved pathways that connect built spaces, parking areas, and any other major facilities within the park.
- Illustrate in the site development drawings all signages along the paved pathways, street signs, pathway labels, trash, and recycling receptacles, directional signs, safety signs, and signs identifying facilities and attractions.
- Determine the provision of adequate, accessible pathways that meet the ABA Standards for Outdoor Spaces.
- Prepare all applicable documentation.

2.10 [S.10] EXTERNAL LIGHTING

2.10.1 PURPOSE

To meet minimum compliance requirements for external lighting and avoid over-lighting of outdoor areas.

2.10.2 ASSESSMENT PRINCIPLES

- The Project will ***assess***:
  - Compliance with IESNA or equivalent standards, for the minimum illuminance and uniformity levels.
  - The area of over-lit outdoor spaces areas.
- The Project will complete the ***calculator*** for S.10 External Lighting based on the results from lighting ***simulation*** software to establish the ***criterion level***.

2.10.3 ASSESSMENT

The criterion requires ***assessing*** the lighting illumination and uniformity levels of all softscape areas, playing fields, access roads, parking areas, and pedestrian pathways and its compliance to meet the minimum requirements from IESNA or approved equivalent lighting standards using an approved lighting ***simulation*** software.

The simulation determines the lighting and uniformity levels of outdoor spaces and the over-lit areas.

The ***calculator*** determines the indicator based on simulated results of the following:

- The lighting illumination and uniformity levels for each outdoor space.
- The percentage of the total area that is over-lit by more than 25% from IESNA or approved equivalent lighting standards.

The ***criterion level*** is established based on the result of the indicator for S.10 External Lighting.

2.10.4 CRITERION LEVELS

Levels	Percentage of the Total Area that is Over-Lit by more than 25% (X) Indicator
-1	Illuminance and uniformity levels failed to meet the IESNA standards.
0	X > 30%
1	20% < X ≤ 30%
2	10% < X ≤ 20%
3	X ≤ 10%

2.10.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Sitemap identifying all softscape areas, playing fields, access roads, parking areas and pedestrian pathways, and the location of lighting fixtures.
	Lighting photometric data sheets from manufacturers
	Relevant lighting drawings and specifications.
Simulation	Lighting Simulation results.
Calculator	S.10 External Lighting Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
Simulation	Updated Lighting Simulation results.
Calculator	Updated S.10 External Lighting Calculator.

2.10.6 EVALUATION

2.10.6.1 General

- Determine the illuminance and uniformity levels of all softscape areas, playing fields, access roads, parking areas, and pedestrian pathways.
- Determine from the lighting standards the minimum required lighting illumination and uniformity levels for each outdoor space.
- Determine from simulation results the lighting illumination and uniformity levels for each space.
- Input the data into the calculator for S.10 External Lighting to determine the percentage of the total area that is over-lit by more than 25%.
- Prepare all applicable documentation.

2.10.6.2 Simulation

- Use an approved lighting simulation software to demonstrate the lighting illumination and uniformity levels for each outdoor space.

2.10.6.3 Calculator

A. Inputs

Area Types & Illuminance and Uniformity Levels Inputs

- Input the description of the lighted area.
- Input the area of each important spaces within the development.
- Input the minimum required illumination levels based on the IESNA standards or approved equivalent.
- Input the minimum required uniformity levels based on the IESNA standards or approved equivalent.
- Input the resulting illumination levels from the lighting simulation.
- Input the resulting uniformity levels from the lighting simulation.

B. Calculations

- Compliance with IESNA or approved equivalent lighting standard = established based on the results of the simulation on the lighting illumination and uniformity levels for each outdoor space.
- Percentage of total areas over-lit by more than 25% from IESNA (or approved equivalent lighting standard) = established based on the calculated ratio in percentage of the over-lit areas over the total area.
- The total area = calculated value based on the sum of each lighted outdoor spaces.
- The percentage of total area over-lit by more than 25% from IESNA or approved equivalent lighting standards = calculated value based on the over-lit areas over the total area of the spaces.
- (X) = calculated percentage of the total area that is over-lit by more than 25%.
- S.10 criterion level = the generated criterion level for S.10 External Lighting based on the specified range from the criterion levels.

2.11 [S.11] WALKABILITY

2.11.1 PURPOSE

To maximize the availability of efficient and user-friendly pedestrian pathways throughout the park.

2.11.2 ASSESSMENT PRINCIPLES

- The Project will ***assess***:
  - The extent to which pedestrians have access throughout the park.
  - Fixtures and features accessible to pathway users.
- The Project will complete the ***calculator*** for S.13 Walkability to establish the ***criterion level.***

2.11.3 ASSESSMENT

The criterion requires ***assessing*** the extent and usability of footpaths throughout the park and the number of fixtures and features associated with the footpaths provided.

Subject to the type of park under assessment the ***calculator*** determines the indicators based on the type of footpaths provided, the adequacy and area of the available footpaths and the number, type and distances between features and fixtures provided and immediately associated with the footpaths provided in the park.

The ***criterion level*** is established based on the result of the indicators for S.13 Walkability.

2.11.4 CRITERION LEVELS

Levels	Area Covered by Path and Offset to Total Area Ratio (X)
-1	X < 0.45
0	0.45 ≤ X < 0.50
1	0.50 ≤ X < 0.55
2	0.55 ≤ X < 0.60
3	X ≥ 0.60

Levels	Average Capacity Ratio (Y)
-1	Y < 0.50
0	0.50 ≤ Y < 0.65
1	0.65 ≤ Y < 0.75
2	0.75 ≤ Y < 0.85
3	Y ≥ 0.85

2.11.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant architectural drawings and landscape drawings and footpath specifications.
Calculator	S.13 Walkability Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built drawings.
Calculator	Updated S.13 Walkability Calculator.

2.11.6 EVALUATION

2.11.6.1 General

- Complete the Project details to indicate the type of park under assessment. Note: This will determine the minimum widths and offsets used for calculation purposes.
- Consider the types of footpaths and associated features provided in the park.
- Input the data into the calculator for S.13 Walkability to determine the performance indicators for the footpaths provided in the park.
- Prepare all applicable documentation.

2.11.6.2 Calculator

A. Inputs

Part 1: Footpaths

- Input the required width and length of each type of footpath provided. Note: If a type of footpath is not available indicate a 0 for width and length.
- Input the total area of the park.
- Area covered by path offset: Total area covered by the qualified pathway and determined offsets from its boundaries according the type of the park.
- The performance indicator (X) is determined based on the total area covered by footpaths accounting for an offset determined by the type of park under assessment.

Part 2: Footpaths Features and Fixtures

- Indicate the availability of features and fixtures, the maximum walking distance between features and fixtures, and the total number of each type immediately associated with the footpaths.

B. Calculations

- (X) = the ratio of the maximum walking distance between specific features and fixtures as per design to the maximum walking distance specified by the calculator for each of features and fixtures type.
- (Y) = the type, number and maximum walking distance between fixtures and features to calculate the average capacity ratio of the footpaths provided in the park.
- S.13 criterion level = the generated criterion level for S.13 Walkability based on the average of (X) and (Y) indicators to determine the specified ranges of the criterion levels.

2.12 [S.12] BIKEABILITY

2.12.1 PURPOSE

To maximize the availability of efficient and user-friendly bicycle pathways throughout the park.

2.12.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the extent and usability of bicycle pathways.
- The Project will complete the ***calculator*** for S.14 Bikeability based on the Bikeability ***plan*** to establish the ***criterion level***.

2.12.3 ASSESSMENT

The ***plan*** determines the quality of the bike paths provided, including, but not necessarily limited to: surface treatments, dedicated signage and safety features of the bike paths.

Subject to the type of park under assessment the ***calculator*** determines the indicator based on the provision of a Bikeability plan and the adequacy and total length of bicycle paths provided in the park.

The ***criterion level*** is established based on the availability and quality of a Bikeability plan and the result of the ***calculator*** indicator for S.14 Bikeability.

2.12.4 CRITERION LEVELS

Levels	Performance Indicator (X)
-1	X < 0.5
0	0.5 ≤ X < 1
1	1 ≤ X < 1.5
2	1.5 ≤ X < 2
3	X ≥ 2

2.12.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant architectural drawings and landscape drawings and bike path specifications.
Calculator	S.14 Bikeability Calculator.
Plan	Bikeability Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant as-built architectural drawings and landscape drawings and bike path specifications.
Calculator	Updated S.14 Bikeability Calculator.
Plan	Updated Bikeability Plan, where applicable.

2.12.6 EVALUATION

2.12.6.1 General

- Complete the Project details to indicate the type of park under assessment. Note: This will determine the minimum widths used for calculation purposes.
- Confirm a compliant Bikeability Plan is provided.
- Consider the types of bike paths provided in the park.
- Input the data into the calculator for S.14 Bikeability to determine the performance indicator for the bike path(s) provided in the park.
- Prepare all applicable documentation.

2.12.6.2 Calculator

A. Inputs

- Input the required width and length of each type of bike path provided and confirm appropriate signage is provided. Note: If a type of bike path is not available indicate a 0 for width and length.
- Input the total area of the park.

B. Calculations

- (X) = total length of the available bike paths relative to a calculated value determined by the total area of the park.
- S.14 criterion level = the generated criterion level for S.14 Bikeability based on the specified ranges of the criterion levels.

2.13 [S.13] CONSTRUCTION PRACTICES

2.13.1 PURPOSE

To adopt responsible construction practices and mitigate the adverse impacts of on-site construction activities.

2.13.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the construction practices in accordance with the requirements of GSAS Construction Management certification.
- The Project will obtain GSAS Construction Management ***certification*** to establish the ***criterion level***.

2.13.3 ASSESSMENT

The criterion requires ***assessing*** the construction practices that conforms with the latest GSAS Construction Management (GSAS-CM) assessment and guidelines. The assessment includes obtaining proof of contractually binding commitment from the owner to pursue the ***GSAS-CM certification*** for the construction practices of the main contractor prior to commencing the construction activities at the site. The proof or evidence indicates the commitment to achieve a minimum target rating in GSAS-CM certification. GSAS-CM certificates from the lowest to the highest ratings are Class D, C, B, A, and A★. During the CDA stage, the assessment verifies the implementation of the commitment for GSAS-CM certification of the construction practices.

The ***criterion level*** is established based on achieved rating of the park in GSAS-CM certification.

2.13.4 CRITERION LEVELS

Levels	Requirements
-1	Park does not demonstrate compliance with the requirements.
0	Park receives GSAS-CM certificate with Class D rating.
1	Park receives GSAS-CM certificate with Class C rating.
2	Park receives GSAS-CM certificate with Class B rating.
3	Park receives GSAS-CM certificate with Class A or A★ rating.

2.13.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Proof of contractually binding commitment from the owner stating the targeted GSAS-CM certification rating.
	Proof of GSASgate registration for construction management certification.

Final Certification Stage (CDA)	
Types	**Descriptions**
Certificate	GSAS-CM certificate issued by GSAS Trust.

2.13.6 EVALUATION

2.13.6.1 General

- Obtain from the owner the proof or evidence of the contractually binding commitment to pursue GSAS-CM certification.
- Determine during construction the proof or evidence that the contractor registers for GSAS-CM certification using GSASgate.
- Prepare all applicable documentation.

3.0 ENERGY

The Energy category is concerned with improving the design and energy performance of the development having a direct and positive impact on both the consumption of resources and environmental quality, including climate change, fossil fuel depletion, air pollution and human comfort, health and wellbeing.

CRITERIA IN ENERGY CATEGORY:

E.2 Energy Use Performance

E.3 Primary Energy Performance

E.4 CO_2 Emissions

E.5 Energy Sub-Metering

E.6 Renewable Energy

CRITERIA SUMMARY

The table below summarizes the weights of the Energy category and each of the associated criteria:

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
E	**ENERGY**				
E.2	Energy Use Performance	-1	3	7.36%	-
E.3	Primary Energy Performance	-1	3	4.83%	-
E.4	CO_2 Emissions	-1	3	4.81%	-
E.5	Energy Sub-Metering	0	3	-	2.00%
E.6	Renewable Energy	0	3	-	2.00%
			Total	**17.00%**	**4.00%**

3.1 [E.2] ENERGY USE PERFORMANCE

3.1.1 PURPOSE

To minimize the energy use through the establishment of GSAS energy use performance.

3.1.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** GSAS energy performance coefficient of the energy use (EPCuse) in relation to applicable GSAS benchmark.
- The Project will complete ***GSAS Energia Suite™*** for E.2 Energy Use Performance to establish the ***criterion level***.

3.1.3 ASSESSMENT

The criterion requires ***assessing*** the annual energy use of the park by calculating the EPC value using ***GSAS Energia Suite™.*** Based on occupancy, operations profile and Auxiliary building type, the assessment considers the energy use associated with the design of the following park and building systems:

- Conditioned and Non-conditioned building areas.
- Water related energy consumption (in kWh/yr).
- Lighting related energy consumption (in kWh/yr).
- Cooling system information based on the Energy efficiency of the installed equipment.
- Renewable Energy production (in kWh/yr)

GSAS Energia Suite™ determines for each park type, the energy performance coefficient (EPC_{use}) based on the aspects of the systems design.

$$EPC_{use} = \frac{E_{use\_norm}}{E_{use\_ref}}$$

Where:

EPC_{use} is the energy use performance coefficient.

E_{use_norm} is the normalized energy use in $kWh/m^2/yr$.

E_{use_ref} is GSAS benchmark for the energy use. It is the reference energy of the notional building for a specific building type in $kWh/m^2/yr$.

The ***criterion level*** is established based on the result of the EPC_{use}.

3.1.4 CRITERION LEVELS

Levels	Energy Use Performance (EPC_{use}) Indicator
-1	$EPC_{use} > 1.0$
0	$0.8 < EPC_{use} \leq 1.0$
1	$0.7 < EPC_{use} \leq 0.8$
2	$0.6 < EPC_{use} \leq 0.7$
3	$EPC_{use} \leq 0.6$

3.1.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant design drawings, specifications, cooling load and other supplementary calculations.
	Relevant architectural design drawings and supporting documents for HVAC equipment, light fixtures and water pumps etc.
Tool	*GSAS Energia Suite*™.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings showing the areas of the evaluated spaces.
	Relevant shop drawings and material data sheets of the HVAC Equipment, light fixtures and water pumps installed at site.
Report	Commissioning or TAB Report of the lighting & irrigation system.
Tool	Updated *GSAS Energia Suite*™.

3.1.6 EVALUATION

3.1.6.1 General

- Determine the cooling system information for energy efficiency.
- Determine the utility system information for park water and lighting related energy consumption.
- Determine auxiliary building energy consumption.
- Determine the system of controls for the outdoor lighting system, renewable energy system, irrigation system and the hot water generation system.
- Determine the specification of the renewable energy system.
- Input the data into GSAS *Energia Suite*™ to determine the EPC value for E.2 Energy Use Performance.
- Prepare all applicable documentation.

3.1.6.2 Calculator

A. Inputs

The following are the inputs required for the E.2 criterion:

Site Utilities Information

- Water Related energy system
- Park lighting related energy system, OR
- Conditioned and non-conditioned auxiliary buildings energy system.

B. Calculations

- *GSAS Energia Suite*™ automatically calculates the EPC value of the energy use and generate the corresponding E.2 Energy Use Performance criterion level.

3.2 [E.3] PRIMARY ENERGY PERFORMANCE

3.2.1 PURPOSE

To reduce the dependence on fossil-based primary energy supply and delivery network through the establishment of GSAS primary energy performance.

3.2.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** GSAS energy performance coefficient of the primary energy (EPC_{pri}) in relation to applicable GSAS benchmark.
- The Project will complete ***GSAS Energia Suite™*** for E.3 Primary Energy Performance to establish the ***criterion level***.

3.2.3 ASSESSMENT

The criterion requires ***assessing*** the annual primary energy of the park by calculating the EPC value using *GSAS Energia Suite*™. The assessment considers the net delivered energy and the primary energy factor (PEF) determined at the national level. Net delivered energy is linked to the various types of energy supply including electricity, gas, thermal, and renewable energy using different types of energy delivery networks.

GSAS Energia Suite™ determines the energy performance coefficient (EPC_{pri}) based on the energy supply and delivery network.

$$EPC_{pri} = \frac{E_{pri\_norm}}{E_{pri\_ref}}$$

Where:

EPC_{pri} is the primary energy performance coefficient.

E_{pri_norm} is the normalized primary energy supplied to the building, in kWh/m²/yr.

E_{pri_ref} is GSAS benchmark for the primary energy supply and delivery network for a specific country, in kWh/m²/yr.

The ***criterion level*** is established based on the result of the EPCpri.

3.2.4 CRITERION LEVELS

Levels	Primary Energy Performance (EPC_{pri}) Indicator
-1	$EPC_{pri} > 1.0$
0	$0.8 < EPC_{pri} \leq 1.0$
1	$0.7 < EPC_{pri} \leq 0.8$
2	$0.6 < EPC_{pri} \leq 0.7$
3	$EPC_{pri} \leq 0.6$

3.2.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant design drawings, specifications, cooling load and other supplementary calculations.
	Relevant architectural design drawings and supporting documents for HVAC equipment, light fixtures and water pumps etc.
Tool	*GSAS Energia Suite*™.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings showing the areas of the evaluated spaces.
	Relevant shop drawings and material data sheets of the HVAC equipment, lighting fixtures and water pumps.
Report	Commissioning or TAB Report of the HVAC, irrigation and lighting system.
Tool	Updated *GSAS Energia Suite*™.

3.2.6 EVALUATION

3.2.6.1 General

- Determine the primary energy sources of the delivered energy to the site.
- Input the data into *GSAS Energia Suite*™ to determine the EPC value for E.3 Primary Energy Performance.
- Prepare all applicable documentation.

3.2.6.2 Calculator

A. Inputs

In addition to the inputs in E.2 the following are the inputs required for the E.3 criterion:

- Coefficient of Performance (COP) of the Cooling system at 46Deg C ambient temperature.

B. Calculations

- *GSAS Energia Suite*™ automatically calculates the EPC value of the primary energy and generate the corresponding E.3 Primary Energy Performance criterion level.

3.3 [E.4] CO_2 EMISSIONS

3.3.1 PURPOSE

To establish CO_2 emissions performance associated with the primary energy supply and delivery network.

3.3.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** GSAS energy performance coefficient of the CO_2 emissions (EPC_{CO2}) in relation to applicable GSAS benchmark.
- The Project will complete ***GSAS Energia Suite™*** for E.4 CO_2 Emissions to establish the ***criterion level***.

3.3.3 ASSESSMENT

The criterion requires ***assessing*** the annual CO_2 emissions of the building by calculating the EPC value using *GSAS Energia Suite*™. The assessment considers the net delivered energy and the CO_2 emission coefficient determined at the national level. Net delivered energy is linked to the various types of energy supply including electricity, gas, thermal, and renewable energy using different types of energy delivery networks.

GSAS Energia Suite™ determines the energy performance coefficient (EPC_{CO2}) based on the energy supply and delivery network.

$$EPC_{CO2} = \frac{E_{CO2\_norm}}{E_{CO2\_ref}}$$

Where:

EPC_{CO2} is the CO_2 emissions performance coefficient.

E_{CO2_norm} is the normalized CO_2 emissions, in kWh/m²/yr.

E_{CO2_ref} is GSAS benchmark for the CO_2 emissions for a specific country, in kWh/m²/yr.

The ***criterion level*** is established based on the result of the EPC_{CO2}.

3.3.4 CRITERION LEVELS

Levels	CO_2 Emissions (EPC_{CO2}) Indicator
-1	$EPC_{CO2} > 1.0$
0	$0.8 < EPC_{CO2} \leq 1.0$
1	$0.7 < EPC_{CO2} \leq 0.8$
2	$0.6 < EPC_{CO2} \leq 0.7$
3	$EPC_{CO2} \leq 0.6$

3.3.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant design drawings, specifications, cooling load and other supplementary calculations.
	Relevant architectural design drawings and supporting documents for HVAC equipment, lighting fixtures and water pumps.
Tool	*GSAS Energia Suite*™.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings showing the areas of the evaluated spaces.
	Relevant shop drawings and material data sheets of HVAC equipment, lighting fixtures and the water pumps.
Report	Commissioning or TAB Report of the HVAC, Irrigation and Lighting system.
Tool	Updated *GSAS Energia Suite*™.

3.3.6 EVALUATION

3.3.6.1 General

- Determine the mix of primary energy supply.
- Input the data into *GSAS Energia Suite*™ to determine the EPC value for E.4 CO_2 Emissions.
- Prepare all applicable documentation.

3.3.6.2 Calculator

A. Inputs

In addition to the inputs in E.2 and E.3 the following are the inputs required for the E.4 criterion:

- Coefficient of Performance (COP) of the Cooling system at 46 Deg C ambient temperature

B. Calculations

- *GSAS Energia Suite*™ automatically calculates the EPC value of the CO_2 emissions and generate the corresponding E.4 CO_2 Emissions criterion level.

3.4 [E.5] ENERGY SUB-METERING

3.4.1 PURPOSE

To install sub-meters for monitoring the major energy consuming systems.

3.4.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the installation of energy sub-meters for monitoring the major energy consuming systems.
- The Project will prepare the Energy Sub-Metering ***plan*** to establish the ***criterion level***.

3.4.3 ASSESSMENT

The criterion requires ***assessing*** the energy sub-metering system. The system provides monitoring, controlling, recording, and reporting of the energy-consuming systems and equipment, devices and appliances, and other motorized equipment. The energy-consuming systems that requires sub-meters are, but not necessarily limited to, HVAC system, lighting system, electric power-driven equipment, and other system's mains in the electrical panel boards. The energy sub-metering plan includes the descriptions of the energy sub-metering system designs and specifications.

The energy sub-metering ***plan*** is a document that fully describes the strategies for monitoring, controlling, recording, analyzing, and reporting the energy-consuming systems and equipment, devices and appliances, and other motorized equipment. The comprehensiveness of the plan to demonstrate compliance with the energy sub-metering installation requirements of the criterion determines the criterion level.

The plan demonstrates the following requirements:

- Strategy for monitoring and recording of the power consumption of the energy-consuming equipment and systems in the park.
- Where applicable, provisions for real time data monitoring and recording of the information suitable for analysis and reporting.
- Instrumentation and control system diagrams that fully describe the specification of the instruments and devices installed for monitoring the energy consuming systems including HVAC system, lighting system, and other motorized equipment.

The ***criterion level*** is established based on the degree of compliance of all the required submittals to completely support the narratives of the energy sub-metering plan.

3.4.4 CRITERION LEVELS

Level	Requirements
0	Plan does not demonstrate compliance with the requirements.
1	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements

3.4.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant design drawings, diagrams, and specifications.
	Where applicable, the BMS schedule of points and control system showing the energy sub-metering system integration with the BMS.
Plan	Energy Sub-Metering Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings, diagrams, and specifications.
	Relevant as-built drawings showing the updates to the previous LOC stage submittals.
Plan	Updated Energy Sub-Metering Plan, when applicable.

3.4.6 EVALUATION

3.4.6.1 General

- Partial compliance for this criterion demonstrates the installation of sub-meters for lighting, or water related systems.
- Full compliance for this criterion demonstrates the installation of sub-meters for all major energy-consuming systems.
- Determine the provision of a system for monitoring, controlling, recording, and reporting of major energy-consuming equipment, fixtures, devices, and appliances.
- Illustrate in the presentation materials or diagrams the strategy adopted for monitoring the energy consumption of the facilities.
- Identify the locations and tapping points of the energy sub-meters.
- Provide the testing and commissioning report of the energy sub-metering system.
- Determine the training program for the proper calibration, use, care, and upkeeping of the energy sub-metering system.
- Prepare all applicable documentation.

3.5 [E.6] RENEWABLE ENERGY

3.5.1 PURPOSE

To install on-site renewable energy generation systems.

3.5.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the installation of on-site renewable energy generating systems with the capacity to contribute to the total annual energy need of the park.
- The Project will prepare the Renewable Energy ***plan*** to establish the ***criterion level***.

3.5.3 ASSESSMENT

The criterion requires ***assessing*** the installation of the on-site renewable energy generating systems for the park. The renewable energy generating systems are the equipment, devices, networks, and controls and instrumentation for collecting, storing, and distributing energy generated from renewable sources. The assessment considers renewable sources such as solar, wind, geothermal, and other sources of renewable energy.

The renewable energy ***plan*** is a document that fully describes the system and strategies for generating energy from renewable sources.

The plan demonstrates the following requirements:

- Strategy for installing and making the system operational to supply the power needs of the energy-consuming equipment, fixtures, and appliances in the facilities.
- Instrumentation and control system diagrams that fully describe the specification of the instruments and devices installed, tested, and commissioned for renewable energy generation and distribution.

The ***criterion level*** is established based on the percentage of contribution of the onsite renewable energy to the total annual energy need of the park.

3.5.4 CRITERION LEVELS

Level	Percentage of Renewable Energy (X) Indicator
0	X < 2%
1	2% ≤ X < 3.5%
2	3.5% ≤ X ≤ 5%
3	X > 5%

3.5.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant design drawings, diagrams, and specifications.
	Where applicable, the BMS schedule of points and control system showing the renewable energy system integration with the BMS.
Plan	Renewable Energy Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings, diagrams, and specifications.
	Relevant as-built drawings showing the updates to the previous LOC stage submittals.
Plan	Updated Renewable Energy Plan, when applicable.

3.5.6 EVALUATION

3.5.6.1 General

- Determine the provision of a renewable energy system for generating and distributing power generated from renewable sources.
- Illustrate in the presentation materials or diagrams the feasibility study conducted for developing and delivering renewable energy system for the park.
- Identify from the drawings the locations of the equipment and distribution networks.
- Determine the testing and commissioning report of the renewable energy system.
- Determine the training program for the proper calibration, use, care, and upkeeping of the renewable energy system.
- Prepare all applicable documentation.

4.0 WATER

The Water category is concerned with water conservation for indoor and outdoor use. The natural water cycle is a system in which water resources are continuously exchanged between the atmosphere, soil water, surface water, ground water and plants. This cycle treats and recharges freshwater supplies. Human consumption of fresh water outpaces the natural cycle and under these circumstances, water cannot be considered as a renewable resource.

Sustainable practices for the efficient use of water, collection, recycling and reuse of water mitigate the environmental impacts associated with water scarcity and depletion.

CRITERIA IN WATER CATEGORY:

W.1 Water Demand Performance

W.2 Water Reuse Performance

W.3 Water Sub-Metering

CRITERIA SUMMARY

The table below summarizes the weights of the Water category and each of the associated criteria:

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
W	**WATER**				
W.1	Water Demand Performance	-1	3	8.00%	-
W.2	Water Reuse Performance	-1	3	14.00%	-
W.3	Water Sub-Metering	0	3	-	2.00%
			Total	**22.00%**	**2.00%**

4.1 [W.1] WATER DEMAND PERFORMANCE

4.1.1 PURPOSE

To reduce the indoor and outdoor water demand of the park.

4.1.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** GSAS water performance coefficient of the indoor and outdoor water demand (WPC_{dem}) in relation to applicable GSAS benchmark.
- The Project will complete ***GSAS Water Suite™*** for W.1 Water Demand Performance to establish the ***criterion level***.

4.1.3 ASSESSMENT

The criterion requires ***assessing*** the annual water demand of the park by calculating the WPC value using *GSAS Water Suite*™. Based on occupancy, operations profile and parks supporting building type the assessment considers the water demand associated with the indoor and outdoor water consumption.

The indoor water consumption is linked to the specifications and schedules of plumbing fixtures and water-consuming appliances.

The outdoor water consumption is linked to the softscape schedules, the crop coefficients, the irrigation system, and the cooling tower makeup water, if applicable.

The process water consumption includes the outdoor water features, artificial lakes or pools and non-standardized water consumption, assessed by evaluating the design features of the water-consuming equipment.

GSAS Water Suite™ determines the Water Performance Coefficient of the indoor and outdoor water demand (WPC_{dem}).

$$WPC_{dem} = \frac{W_{dem\_occ} + W_{dem\_out}}{W_{ref\_occ} + W_{ref\_occ}}$$

Where:

WPC_{dem} is the water demand performance coefficient.

W_{dem_occ} is the normalized water demand of the occupants for indoor use, in m^3/yr.

W_{dem_out} is the normalized water demand of the outdoor use, in m^3/yr.

W_{ref_occ} is GSAS benchmark for the water demand of the occupants for indoor use for a specific park, in m^3/yr.

W_{ref_out} is GSAS benchmark for the water demand of the outdoor use, in m^3/yr.

The ***criterion level*** is established based on the result of the WPCdem.

4.1.4 CRITERION LEVELS

Level	Water Demand Performance (WPC_{dem}) Indicator
-1	$WPC_{dem} > 1.00$
0	$0.90 < WPC_{dem} \leq 1.00$
1	$0.85 < WPC_{dem} \leq 0.90$
2	$0.80 < WPC_{dem} \leq 0.85$
3	$WPC_{dem} \leq 0.80$

4.1.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Report stating number of occupants, operating hours, park or site area softscape area and other supporting information.
	Specifications for plumbing fixtures.
	Landscaping and irrigation plan.
Tool	*GSAS Water Suite™.*

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings.
	Relevant shop drawings and material data sheets.
Report	Testing Reports for the plumbing and irrigation systems.
Tool	Updated *GSAS Water Suite™.*

4.1.6 EVALUATION

4.1.6.1 General

- Determine the project information, category, and zone type for the water criteria assessments.
- Determine the site area, the built-up area, and the landscape area.
- Determine the design occupancy load of the park.
- Illustrate in the design drawings and schedule the quantities of the plumbing fixtures and its documented flowrates.
- Determine if there is demand for process water which can include water features, swimming pool or other specific applications.
- Determine the landscape design that requires water for irrigation.
- Determine from HVAC drawings and specification the make-up water requirements of the cooling towers.
- Input the data into *GSAS Water Suite*™ to determine the WPC value for W.1 Water Demand Performance.
- Prepare all applicable documentation.

4.1.6.2 Calculator

A. Inputs

General Information Inputs

- Input the project details.
- Input the site area
- Input the built-up area.
- Input the Landscape area.
- Input the number of daily regular occupants of the facility.
- Input the number of average daily visitors of the facility.
- Input the gender ratio of the occupants.
- Tick the applicable category/zone type for the WPC calculations.
- Select indoor-use tab to input values required to calculate the water demand for indoor use.

- Select the irrigation tab to input values required to calculate the water demand for outdoor irrigation water.
- Select the cooling tower tab to input values required to calculate the makeup water demand of the cooling tower.

Indoor-Use Inputs

- Part 1a: Fixtures
  - Input the documented flowrates and quantities of the flush fixtures.
  - Input the documented flowrates and quantities of the flow fixtures.
- Part 1b: Prescriptive Method for Process Water
  - Select from the pulldown menu if non-standardized water is use for the water features.
  - Select from the pulldown menu if there are indoor water features.
  - Select from the pulldown menu if there are swimming pools.
  - Select from the pulldown menu if there is a jacuzzi.
  - Select from the pulldown menu if there is a sauna.
  - Select from the pulldown menu if there are medical hot tubs.
  - Select from the pulldown menu if there are other facilities or fixtures that require non-standardized water.

Outdoor-Use Inputs

- Part 1: Landscape Section
  - Input the species name of the landscape section in the corresponding species type.
  - Input the area of the landscape section in the corresponding species type.
  - Input the nativity of the species in the landscape section.
  - Input the species factor of the species in the landscape section.
  - Input the density factor of the species in the landscape section.
  - Input the microclimate factor of the species in the landscape section.
  - Input type of irrigation system if using sprinkler or drip type.

Cooling Tower Inputs

- Part 1: Cooling Tower
  - Input the annual volume of make-up water required by the cooling towers of the HVAC system.

B. Calculations

- *GSAS Water Suite*™ automatically calculates the WPC value of water demand and generate the corresponding W.1 Water Demand Performance criterion level.

4.2 [W.2] WATER REUSE PERFORMANCE

4.2.1 PURPOSE

To maximize water recycling and reuse in the park.

4.2.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** GSAS water performance coefficient of the water supply from recycling and reuse strategies (WPC_{re}) in relation to the applicable GSAS benchmark.
- The Project will complete ***GSAS Water Suite™*** for W.2 Water Reuse Performance to establish the ***criterion level***.

4.2.3 ASSESSMENT

The criterion requires assessing the design and installation of water reuse and recycling systems. Such systems include the equipment, piping, storage tanks, and filtration system that collectively performs to collect, treat, store, and distribute treated water for reuse and recycling. The assessment considers treated water from rainwater, greywater, cooling tower water, HVAC condensate drain water and community based Treated Sewage Effluent (TSE) supply.

GSAS Water Suite™ determines the Water Performance Coefficient of the water supply from recycling and reuse strategies (WPC_{re}).

$$WPC_{reuse} = \frac{(W_{dem\_occ} + W_{dem\_out}) - W_{reuse}}{W_{ref\_occ} + W_{ref\_out}}$$

Where:

WPC_{reuse} is the water reuse performance coefficient.

W_{dem_occ} is the normalized water demand of the occupants for indoor use, in m^3/yr.

W_{dem_out} is the normalized water demand of the outdoor use, in m^3/yr.

W_{reuse} is the total amount of water reclaimed from various sources including rainwater, condensate water, greywater and TSE, in m^3/yr.

W_{ref_occ} is GSAS benchmark for the water demand of the occupants for indoor use for a specific building type, in m^3/yr.

W_{ref_out} is GSAS benchmark for the water demand of the outdoor use, in m^3/yr.

The ***criterion level*** is established based on the result of the $WPC_{reuse.}$

4.2.4 CRITERION LEVELS

Level	Water Reuse Performance (WPC_{reuse}) Indicator
-1	$WPC_{reuse} > 1.00$
0	$0.85 < WPC_{reuse} \leq 1.00$
1	$0.75 < WPC_{reuse} \leq 0.85$
2	$0.65 < WPC_{reuse} \leq 0.75$
3	$WPC_{reuse} \leq 0.65$

4.2.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Information for the water reclamation and treatment systems, including plans, drawings, specifications and controls.
Tool	*GSAS Water Suite*™.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings.
	Relevant shop drawings and material data sheets.
Report	Commissioning report of the water reclamation and treatment systems.
Tool	Updated *GSAS Water Suite*™.

4.2.6 EVALUATION

4.2.6.1 General

- Determine the reclaimed water that is recycled and reuse for toilet flushing.
- Determine the reclaimed water that is recycled and reuse for irrigation water system.
- Determine the availability of the community treated sewage effluent (TSE).
- Illustrate in the design drawings the point-of-use of the recycled water and TSE water.
- Input the data into *GSAS Water Suite*™ to determine the WPC value for W.2 Water Reuse Performance.
- Prepare all applicable documentation.

4.2.6.2 Calculator

A. Inputs

Inputs for the Reclamation for Non-Potable Water Stored

- Select from the pulldown menu if reclaimed water is to be reuse for toilet flushing.
- Input the capacity or volume of reclaimed water to be reuse for toilet flushing.

Inputs for the Reclaimed Water for Irrigation

- Select from the pulldown menu if there are rainwater sensors available for irrigation network.
- Select from the pulldown menu if collected rainwater is to be use for irrigation.
- Input the details of the collection areas when collected rainwater is reuse for irrigation. Exclude the exposed surfaces as well as interlock and asphalt paving that have no proper surface water collections and piping network.
- Select from the pulldown menu if condensate water from HVAC system is to be use for irrigation.
- Input the estimated volume of condensate water to be collected in the entire year when the condensate water is harvested to be use for irrigation.
- Select from the pulldown menu if treated greywater is to be use for irrigation.
- Input the estimated annual volume of greywater to be treated and recycled for irrigation water use.
- Select from the pulldown menu if the community TSE water generated from public utility plant and distributed through public utility network is to be use for irrigation.

- Input the estimated annual volume of TSE water required to be use for irrigation.
- Select from the pulldown menu if TSE water is use for cooling tower makeup water.
- Input the estimated annual volume of TSE water use for cooling tower makeup water.

B. Calculations

- *GSAS Water Suite*™ automatically calculates the WPC value of water reuse and generate the corresponding W.2 Water Reuse Performance criterion level.

4.3 [W.3] WATER SUB-METERING

4.3.1 PURPOSE

To install sub-meters for monitoring the major water consuming systems.

4.3.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the installation of water sub-meters for monitoring the major water consuming systems.
- The Project will prepare the Water Sub-Metering ***plan*** to establish the ***criterion level***.

4.3.3 ASSESSMENT

The criterion requires ***assessing*** the water sub-metering system. The system provides monitoring and recording of the park mains' domestic and irrigation water consumptions. The water-consuming systems that requires sub-meters are the indoor and outdoor plumbing and irrigation systems. The water sub-metering plan includes the descriptions of the water sub-metering system designs and specifications.

The water sub-metering ***plan*** is a document that fully describes the strategies for monitoring and recording of the park mains' domestic and irrigation water consumptions. The comprehensiveness of the plan to demonstrate compliance with the water sub-metering installation requirements of the criterion determines the criterion level.

The plan demonstrates the following requirements:

- Strategy for monitoring and recording of the water consumption of equipment, fixtures, and appliances in the park.
- Where applicable, provisions for real time data monitoring and recording of the information suitable for analysis and reporting.
- Instrumentation and control system diagram that fully describes the specification of the instruments and devices installed for monitoring the water consuming systems, such as plumbing and irrigation water systems.

The ***criterion level*** is established based on the degree of compliance of all the required submittals to completely support the narratives of the water sub-metering plan.

4.3.4 CRITERION LEVELS

Level	Requirements
0	Plan does not demonstrate compliance with the requirements.
1	Plan demonstrates partial compliance with the requirements, including the plans for the main water.
3	Plan demonstrates full compliance with the requirements

4.3.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant design drawings, diagrams, and specifications.
	Where applicable, the BMS schedule of points and control system showing the water sub-metering system integration with the BMS.
Plan	Water Sub-Metering Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings, diagrams, and specifications.
	Relevant as-built drawings showing the updates to the previous LOC stage submittals.
Plan	Updated Water Sub-Metering Plan, when applicable.

4.3.6 EVALUATION

4.3.6.1 General

- Partial compliance for this criterion demonstrates the installation of sub-meters for indoor OR outdoor water consuming systems.
- Full compliance for this criterion demonstrates the installation of sub-meters for indoor AND outdoor water consuming systems.
- Determine the provision of a system for monitoring, and recording of major water-consuming equipment, fixtures, and appliances.
- Illustrate in the presentation materials or diagrams the strategy adopted for monitoring the water consumption of the facilities.
- Identify the locations and tapping points of the water sub-meters.
- Provide the testing and commissioning report of the water sub-metering system.
- Determine the training program for the proper calibration, use, care, and upkeeping of the water sub-metering system.
- Prepare all applicable documentation.

5.0 MATERIALS

The Materials category is concerned with the conservation of natural resources and the use or reuse of materials and structure to have the least environmental impact. The construction sector has a significant impact on the environment. It accounts for the consumption of approximately 40% of the raw stone, gravel and sand used worldwide annually, 25% of the raw timber, and the associated embodied carbon emissions for such materials.

Eco-friendly construction materials can contribute to reduce the adverse impacts on the environment, and create sustainable buildings promoting the health and wellbeing of occupants.

CRITERIA IN MATERIALS CATEGORY:

M.1 Locally Sourced Materials

M.2 Materials Eco-Labeling

M.3 Recycled Content of Materials

M.4 Materials Reuse

M.5 Cut & Fill Optimization

M.6 Design for Disassembly

M.7 Responsible Sourcing of Materials

CRITERIA SUMMARY

The table below summarizes the weights of the Materials category and each of the associated criteria:

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
M	**MATERIALS**				
M.1	Locally Sourced Materials	-1	3	1.30%	-
M.2	Materials Eco-Labeling	-1	3	2.30%	2.00%
M.3	Recycled Content of Materials	-1	3	1.90%	-
M.4	Materials Reuse	-1	3	1.05%	-
M.5	Cut & Fill Optimization	-1	3	0.70%	-
M.6	Design for Disassembly	-1	3	0.75%	-
M.7	Responsible Sourcing of Materials	0	3	-	1.00%
			Total	**8.00%**	**3.00%**

5.1 [M.1] LOCALLY SOURCED MATERIALS

5.1.1 PURPOSE

To maximize the use of local material and reduce the impact of long-distance transportation.

5.1.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the cost and number of raw materials and manufactured/ assembled products of local origin, including MEP components.
- The Project will complete the ***calculator*** for M.1 Locally Sourced Materials to establish the ***criterion level***.

5.1.3 ASSESSMENT

The criterion requires ***assessing*** the local content cost and availability fraction of the locally sourced materials. Locally sourced materials are locally manufactured or assembled materials with content or components either coming from local or foreign origins. Materials vary according to the percentage of their local contents or components or the location of their assembly.

There are two groups of material listings of the locally sourced materials in the assessment, the major construction materials, and the minor construction materials. The major construction materials are locally sourced materials that have significant contributions to the percentage of total material cost. The cost of local content is calculated based on a percentage of the local content weight to the total material weight multiplied by the material cost. The minor construction materials are materials that have relatively small contributions to the park in terms of weight, volume or cost and therefore are grouped under this category to promote capacity building of various industries in the construction sector. The assessment includes materials from the mechanical, electrical, and plumbing (MEP) systems and equipment.

The ***calculator*** determines the indicator based on the sum of the percentages of the local content cost in major construction materials and the availability fraction for minor construction materials.

The ***criterion level*** is established based on the result of the indicator for M.1 Locally Sourced Materials.

5.1.4 CRITERION LEVELS

Levels	Locally Sourced Materials (X) Indicator
-1	X < 30%
0	30% ≤ X < 40%
1	40% ≤ X < 50%
2	50% ≤ X < 60%
3	X ≥ 60%

5.1.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Evidence of total materials cost such as bill of quantities.
	Evidence of locally sourced materials cost such as cost estimates or bill of quantities.
	Relevant specifications indicating the origin of the locally sourced materials and percentage of local content.
Calculator	M.1 Locally Sourced Materials Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Evidence of the locally sourced materials cost and the total materials cost for the project, such as excerpts of up to date monthly certification approved by the Client (BOQ format).
	Evidence of the use of the locally sourced materials on site, such as Material Approval Requests.
	If applicable, updated specifications indicating the origin of the locally sourced materials and the percentage of local content.
Calculator	Updated M.1 Locally Sourced Materials Calculator.

5.1.6 EVALUATION

5.1.6.1 General

- Determine the specifications and bill of quantities of the construction materials and products.
- Determine the specified locally sourced construction materials and products.
- Determine from the material data sheets the percentage of the local content of the specified locally sourced construction materials and products.
- Determine from the bill of quantities the itemized cost of each material and the total cost of the construction materials.
- Prepare the descriptions of the construction materials following the latest Construction Specification Institute (CSI) MasterFormat and use a uniform currency for costings and pricings.
- Input the data into the calculator for M.1 Locally Sourced Materials to determine the percentages of the local content cost in major construction materials and the availability fraction for minor construction materials.
- Prepare all applicable documentation.

5.1.6.2 Calculator

A. Inputs

Part 1 – Major Construction Materials Inputs

- Input the descriptions of the locally manufactured or assembled major construction materials.
- Input the costs of the materials.
- Select from the pulldown menu the percentage of local content or "Locally Assembled" in case the local content is 0% but the material is assembled in the country.

Part 2 – Minor Construction Materials Inputs

- Input the descriptions of the locally manufactured or assembled minor construction materials.
- Select from the pulldown menu the percentage of local content or "Locally Assembled" in case the local content is 0% but the material is assembled in the country.

B. Calculations

Part 1 – Major Construction Materials Calculations

- Cost of local content = calculated value based on the cost of material and the local content factor.
- Total cost of the local content = sum of the local content costs of the major construction materials.
- Total cost of materials for the project = sum of the sub-total costs and lump sum cost of the construction materials, obtained from the Materials input sheet.
- Percentage of the local content cost = calculated value based on the total cost of the local content over the total cost of the construction materials.

Part 2 – Minor Construction Materials Calculations

- Factor = assigned value based on the selected percentage of local content of the major construction material.
- Total availability fraction = sum of the availability fraction of all minor construction materials.

Summary Calculations

- Achieved values = results of Part 1 and Part 2 calculations.
- Maximum targets = fixed values assigned for the calculations of the percentages of the local content cost in major construction materials and availability fraction for minor construction materials.
- Weights = fixed values assigned to give relative importance for the calculations of local content cost and availability fraction.
- Weighted percentage of the local content cost = calculated value based on the achieved value, maximum target, and the assigned weight for major construction materials.
- Weighted percentage of the availability fraction = calculated value based on the achieved value, maximum target, and the assigned weight for minor construction materials.
- (X) = sum of the weighted percentages of the local content cost in major construction materials and the availability fraction of minor construction materials.
- M.1 criterion level = the generated criterion level for M.1 Locally Sourced Materials based on the specified range from the criterion levels.

5.2 [M.2] MATERIALS ECO-LABELING

5.2.1 PURPOSE

To use certified products and materials with enhanced environmental, health and resources conservation attributes.

5.2.2 ASSESSMENT PRINCIPLES

- The Project will **assess** the cost and number of products and materials with GSAS approved certification for eco-labeling.
- The Project will complete the ***calculator*** for M.2 Materials Eco-Labeling to establish the ***criterion level***.

5.2.3 ASSESSMENT

The criterion requires ***assessing*** the major construction materials and minor construction materials with eco-labels. Eco-labeled materials are materials labeled with GSAS approved certification. Certificates identify eco-labeled materials as follows:

- Material with Environmental Product Declaration (EPD)
- Multi-attribute material
- Single-attribute material

There are two groups of material listings of the eco-labeled materials in the assessment, the major construction materials and the minor construction materials. The major construction materials are eco-labeled materials that have significant contributions to the percentage of total material cost. The assessment considers the cost of eco-labeled major materials. The minor construction materials are materials that have relatively small contributions to the park in terms of weight, volume or cost and therefore are grouped under this category to promote capacity building of various industries in the construction sector.

The ***calculator*** determines the indicator based on the percentage of cost of major materials with eco-labeling and the availability fraction of eco-labeled minor construction materials. The calculator adds the incentive weights given for having more than four eco-labeled minor construction materials.

The ***criterion level*** is established based on the result of the indicator for M.2 Materials Eco-Labeling.

5.2.4 CRITERION LEVELS

Levels	Materials Eco-Labeling (X) Indicator
-1	X < 15%
0	15% ≤ X < 35%
1	35% ≤ X < 55%
2	55% ≤ X < 75%
3	X ≥ 75%
Incentive	0.5% per additional eco-labeled minor material up to 2% max

5.2.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Evidence of total materials cost such as bill of quantities.
	Evidence of eco-labeled materials cost such as cost estimates or bill of quantities.
	Certificates of the materials with eco-labeling.
Calculator	M.2 Materials Eco-Labeling Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Evidence of the eco-labeled materials cost and the total materials cost for the project, such as excerpts of up to date monthly certification approved by the Client (BOQ format).
	Evidence of the use of the eco-labeled materials on site, such as Material Approval Requests.
Calculator	Updated M.2 Materials Eco-Labeling Calculator.

5.2.6 EVALUATION

5.2.6.1 General

- Determine the specified eco-labeled materials and products.
- Input the data into the calculator for M.2 Materials Eco-Labeling to determine the percentages of the eco-labeled major construction materials and the availability fraction for minor construction materials.
- Prepare all applicable documentation.

5.2.6.2 Calculator

A. Inputs

Part 1 – Major Construction Materials Inputs

- Input the descriptions of the major construction materials with eco-labeling. Include in the descriptions of the name of the manufacturer of the supplied materials and products.
- Input the costs of the materials.
- Select from the pulldown menu the label type of the eco-labeled major construction materials.

Part 2 – Minor Construction Materials Inputs

- Input the descriptions of the minor construction materials with eco-labeling.
- Select from the pulldown menu the label type of the eco-labeled specialty materials.
- Extended List of eco-labeled materials. In case there are more than four eco-labeled minor materials, enter them in this list to achieve incentive score.

B. Calculations

Part 1 – Major Construction Materials Calculations

- Total cost of major construction materials with eco-labeling = sum of the itemized major construction materials with eco-labeling.
- Total cost of materials for the project = sum of the sub-total costs and lump sum cost of the construction materials, obtained from the Materials input sheet.
- Percentage of the cost of major materials with eco-labeling = calculated value based on the total cost of major construction materials with eco-labeling over the total cost of the materials for the park.

Part 2 – Minor Construction Materials Calculations

- Availability fraction = calculated value based on the eco-labeling of minor construction materials.
- Total availability fraction of Eco-labeled material = sum of the availability fraction of all minor construction materials.
- Availability fraction of extended list (for incentive weight) = sum of the availability fraction of incentivized minor construction materials.

Summary Calculations

- Achieved values = results of Part 1 and Part 2 calculations.
- Maximum targets = fixed values assigned for the calculations of the percentages of the cost of major construction materials with eco-labeling and availability fraction for minor construction materials.
- Weights = fixed values assigned to give relative importance for the calculations of cost of major construction materials with eco-labeling and availability fraction.
- Weighted percentage cost of major construction materials with eco-labeling = calculated value based on the achieved value, maximum target, and the assigned weight for major construction materials.
- Weighted percentage of the availability fraction = calculated value based on the achieved value, maximum target, and the assigned weight for minor construction materials.
- (X) = sum of the weighted percentages of cost of major materials with eco-labeling and the availability fraction of eco-labeled materials.
- Incentive score (%) = calculated value based on the availability fraction of the eco-labeled materials exceed the maximum target set by the calculator.
- M.2 criterion level = the generated criterion level for M.2 Materials Eco-Labeling based on the specified range from the criterion levels.

5.3 [M.3] RECYCLED CONTENT OF MATERIALS

5.3.1 PURPOSE

To use products and materials with recycled content.

5.3.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the cost of building materials with recycled content, excluding MEP components, against the total cost of materials.
- The Project will complete the ***calculator*** for M.3 Recycled Content of Materials to establish the ***criterion level***.

5.3.3 ASSESSMENT

The criterion requires ***assessing*** the construction materials with recycled content to help reduce the impacts associated with the use of virgin materials. Construction materials with recycled contents are building elements and materials manufactured with recycled materials. The assessment excludes materials from the mechanical, electrical, and plumbing (MEP) systems and equipment. Where materials are eligible for both M.3 Recycled Content of Materials and M.4 Materials Reuse criteria, the assessment permits claiming for one criterion only to avoid double counting.

The ***calculator*** determines the indicator based on the percentage of total cost of recycled content over the total cost of materials.

The ***criterion level*** is established based on the result of the indicator for M.3 Recycled Content of Materials.

5.3.4 CRITERION LEVELS

Levels	Recycled Content (X) Indicator
-1	X < 10%
0	10% ≤ X < 15%
1	15% ≤ X < 20%
2	20% ≤ X < 25%
3	X ≥ 25%

5.3.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Evidence of total materials cost (MEP excluded) such as bill of quantities.
	Evidence of materials with recycled content cost such as cost estimates or bill of quantities.
	Specifications of the materials with recycled content indicating the percentage of recycled content.
Calculator	M.3 Recycled Content of Materials Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Evidence of the materials with recycled content cost and the total materials cost for the project, such as excerpts of up to date monthly certification approved by the Client (BOQ format).
	Evidence of the use of materials with recycled content on site, such as Material Approval Requests.
	If applicable, update material data sheets of the materials with recycled content indicating the percentage of recycled content.
Calculator	M.3 Recycled Content of Materials Calculator.

5.3.6 EVALUATION

5.3.6.1 General

- For this criterion, use the unified Materials Inputs sheet in the calculator to list all the relevant construction materials and corresponding cost estimates. The list follows the format of the Construction Specification Institute (CSI) MasterFormat 2016.
- Determine the specified materials with recycled content.
- Determine from the material data sheets the percentage of recycled content in the materials.
- Determine from the bill of quantities and specification, the percentage of the recycled content weight to the total material weight.
- Prepare all applicable documentation.

5.3.6.2 Calculator

A. Inputs

Materials Inputs Sheet

- Input in this section the costs of materials considered in the different materials criteria, as per the CSI materials classification. The Materials Input sheet includes cells for inputting all other materials that are not listed by default in the calculator's materials division numbers.
- If any of the materials to be considered is not in the list, use one of the blank lines within the corresponding Division.
- Use the 'Not broken-down materials' rows at the bottom of each Division and the Total Cost of MEP line to calculate the Total Cost of Materials for the park. Ensure the calculated Total Cost of Materials for each division matches those in the BOQ of the project.

Recycled Content Inputs

- Input the percentage of recycled content of the construction materials.

B. Calculations

Materials Input Sheet Calculations

- Sub-total Cost of Materials per Division = sum of the Costs of Materials per Division, including the lump sums (Not Broken-Down Materials).

Recycled Content Calculations

- Descriptions and costs of construction materials with recycled content = referenced from materials input section.
- Cost of recycled content = calculated value based from the cost of material with recycled content and the percentage of cost of the recycled content.
- Sub-total cost per division = sum of the breakdown of costs of materials per division.
- Total cost of recycled content per division = sum of the breakdown of sub-total cost of recycled content per division.
- Total cost of materials (excluding MEP) = sum of the sub-total costs of materials per division excluding MEP.
- (X) = calculated value based on the percentage of total cost of recycled content over the total cost of materials, excluding MEP.
- M.3 criterion level = the generated criterion level for M.3 Recycled Content of Materials based on the specified range from the criterion levels.

5.4 [M.4] MATERIALS REUSE

5.4.1 PURPOSE

To reuse building materials recovered from on or off-site sources.

5.4.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the cost of reused building materials, components and products, excluding MEP materials, recovered from on-site or off-site sources against the total cost of materials.
- The Project will complete the ***calculator*** for M.4 Materials Reuse to establish the ***criterion level***.

5.4.3 ASSESSMENT

The criterion requires ***assessing*** the reused construction materials. Reused construction materials are building elements and materials that are salvaged, reused, or refurbished from on- or off-site. Where materials are eligible for both M.3 Recycled Content of Materials and M.4 Materials Reuse criteria, the assessment permits claiming for one criterion only to avoid double counting. The assessment excludes materials from the mechanical, electrical, and plumbing (MEP) systems and equipment.

The ***calculator*** determines the indicator based on the percentage of total value of reused materials over the total cost of construction materials excluding the MEP systems.

The ***criterion level*** is established based on the result of the indicator for M.4 Materials Reuse.

5.4.4 CRITERION LEVELS

Levels	Materials Reuse (X) Indicator
-1	X < 1.5%
0	1.5% ≤ X < 2.5%
1	2.5% ≤ X < 5%
2	5% ≤ X < 7.5%
3	X ≥ 7.5%

5.4.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Evidence of total materials cost (MEP excluded) such as bill of quantities.
	Evidence of reused materials cost such as cost estimates or bill of quantities.
	Relevant specifications describing the reused materials.
Calculator	M.4 Materials Reuse Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Evidence of the reused materials cost and the total materials cost for the project, such as excerpts of up to date monthly certification approved by the Client (BOQ format).
	Evidence of the use of the reused materials on site, such as Material Approval Requests.
Calculator	M.4 Materials Reuse Calculator.

5.4.6 EVALUATION

5.4.6.1 General

- For this criterion, use the unified Materials Inputs sheet in the calculator to list all the relevant construction materials and corresponding cost estimates. The list follows the format of the Construction Specification Institute (CSI) MasterFormat 2016.
- Determine the relevant reused materials.
- Determine the current economic value or market value of the reused materials.
- Input the data into the calculator for M.4 Materials Reuse to determine the percentage of reused materials over the total material cost of the park (excluding MEP).
- Prepare all applicable documentation.

5.4.6.2 Calculator

A. Inputs

Materials Inputs Sheet

- Input in this section the costs of materials considered in the different materials criteria, as per the CSI materials classification. The Materials Input sheet includes cells for inputting all other materials that are not listed by default in the calculator's materials division numbers.
- If any of the materials to be considered is not in the list, use one of the blank lines within the corresponding Division.
- Use the 'Not broken-down materials' rows at the bottom of each Division and the Total Cost of MEP line to calculate the Total Cost of Materials for the park. Ensure the calculated Total Cost of Materials for each division matches those in the BOQ of the project.

Reused Material Value Inputs

- Input the current economic value or market value or contract value of the reused materials.

B. Calculations

Materials Input Sheet Calculations

- Sub-total Cost of Materials per Division = sum of the Costs of Materials per Division, including the lump sums (Not Broken-Down Materials).

Reused Material Value Calculations

- Sub-total cost of materials per division = sum of the breakdown of costs of construction materials.
- Total cost of materials (excluding MEP) = sum of the sub-total cost of materials per division excluding MEP.
- Sub-total value of reused materials per division = sum of the breakdown of reused material value.
- Total value of reused materials = sum of the sub-total value of reused materials per division excluding MEP.
- (X) = calculated value based on the percentage of reused materials over the total cost of materials (excluding MEP).
- M.4 criterion level = the generated criterion level for M.4 Materials Reuse based on the specified range from the criterion levels.

5.5 [M.5] CUT & FILL OPTIMIZATION

5.5.1 PURPOSE

To minimize transportation and disposal of soil through reuse and optimization of cut and fill balance.

5.5.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the overall weight of excavated materials reused onsite for filling purposes against the overall weight of excavated materials generated from site:
- The Project will complete the ***calculator*** for M.5 Cut & Fill Optimization to establish the ***criterion level***.

5.5.3 ASSESSMENT

The criterion requires ***assessing*** the weight of the excavated materials reused on-site that are originated from the site or form another construction site. The assessment determines the overall weight fraction of the excavated materials reused in the development against the weight of either excavated or fill materials, whichever is maximum.

The ***calculator*** determines the indicator based on the percentage of total weight of reused excavated materials over the total weight of maximum excavated or fill materials.

The ***criterion level*** is established based on the result of the indicator for M.5 Cut & Fill Optimization.

5.5.4 CRITERION LEVELS

Levels	Cut & Fill Optimization (X) Indicator
-1	X < 25%
0	25% ≤ X < 35%
1	35% ≤ X < 50%
2	50% ≤ X < 80%
3	X ≥ 80%

5.5.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Evidence of total weight of predicted excavated materials as well as areas to be filled as per design, such as bill of quantities or cost estimates.
	Relevant drawings and specifications showing the areas that to be excavated on-site.
	Relevant drawings and specifications showing the areas that to be filled with the excavated materials.
	Relevant documents and specifications showing how project secures the needed fill materials from off-site sources in case of needed.
Calculator	M.5 Cut & Fill Optimization Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Evidence of the total amount of excavated materials generated on-site excerpts of up to date monthly certification approved by the Client (BOQ format).
	Evidence of reusing excavated materials from on- or off-site sources such as Materials Approval Request (MAR) and excerpts of up to date monthly certification approved by the Client (BOQ format).
	Relevant as-built drawings and specifications showing the reused excavated and filled areas.
	Collection and delivery invoices or monthly logs issued by the transporter or destination site/facility, showing the quantities per type of material.
Calculator	Updated M.5 Cut & Fill Optimization Calculator.

5.5.6 EVALUATION

5.5.6.1 General

- Complete the Project details to indicate the type of park under assessment.
- Determine from the design drawings and bill of quantities the total weight of excavated materials originated from site and the total weight of fill materials sourced from on- or off-site construction sites.
- Prepare the descriptions of the processed on-site excavated materials and off-site sourced fill materials.
- Input the data into the calculator for M.5 Cut & Fill Optimization to determine the performance indicators.
- Prepare all applicable documentation.

5.5.6.2 Calculator

A. Inputs

Part 1 - Cut

- Input the total amount of excavated material originating from the construction site.

Part 2 - Fill

- Input the total amount of fill material used on-site.
- Input the amount of excavated material reused on-site.
- Input the amount of material imported from other construction sites or off-site sources.

B. Calculations

- Amount of materials sent to landfill = calculated value based on the total amount of materials excavated on-site minus the amount of materials reused on-sit.
- The amount of imported virgin material = calculated value based on the total amount of materials filled on-site minus the sum of the amount of materials reused on-site and sourced from other construction sites or similar off-site sources.
- Weighted fractions = calculated value based on the amount of excavated materials sent to landfill, reused on-site, imported from other construction sites and materials imported from virgin sources.
- Overall weighted fraction = sum of all weighted fractions.

- Maximum value of excavated and filled = the maximum of the amount of materials excavated on-site or materials filled on-site.
- (X) Indicator = percentage of the overall weighted fraction to the maximum value of excavated and fill material.
- M.5 criterion level = the generated criterion level for M.5 Cut & Fill Optimization based on the specified range from the criterion levels.

5.6 [M.6] DESIGN FOR DISASSEMBLY

5.6.1 PURPOSE

To design building elements for ease of disassembly and facilitate future reuse.

5.6.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the cost of building elements and components, excluding MEP materials, that can be readily disassembled, fit for purpose for future reuse against the total cost of materials.
- The Project will complete the ***calculator*** for M.6 Design for Disassembly to establish the ***criterion level***.

5.6.3 ASSESSMENT

The criterion requires ***assessing*** the cost of materials designed for disassembly. The materials designed for disassembly are building elements and components that can be readily disassembled and fit for purpose for future reuse, excluding mechanical, electrical, and plumbing (MEP) systems and items subject to wear and tear during their service life.

The ***calculator*** determines the indicator based on the percentage of total cost of materials designed for disassembly over the total cost of construction materials, excluding MEP, and items prone to wear and tear.

The ***criterion level*** is established based on the result of the indicator for M.6 Design for Disassembly.

5.6.4 CRITERION LEVELS

Levels	Design for Disassembly (X) Indicator
-1	X < 10%
0	10% ≤ X < 20%
1	20% ≤ X < 30%
2	30% ≤ X < 40%
3	X ≥ 40%

5.6.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Evidence of total materials cost for the project (excluding MEP and materials subject to wear and tear), for example the bill of quantities.
	Evidence of designed for disassembly materials cost, for example cost estimates or bill of quantities.
	Relevant drawings and specifications showing the elements that can be disassembled and reuse in the future and the method statements demonstrating the disassembly of materials.
Calculator	M.6 Design for Disassembly Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Evidence of the cost of designed for disassembly materials, such as excerpts of up to date monthly certification approved by the Client (BOQ format).
	As-built drawings showing the elements that can be disassembled and reused in future.
	Evidence of the use of materials designed for disassembly on site, such as Materials Approval Requests.
Calculator	Updated M.6 Design for Disassembly Calculator.

5.6.6 EVALUATION

5.6.6.1 General

- For this criterion use the unified Materials Inputs tab in the calculator to list all the specified construction materials and cost estimates. The list follows the format of the Construction Specification Institute (CSI) MasterFormat 2016.
- Determine the specified materials designed for disassembly.
- Determine the costs of materials designed for disassembly.
- Input the data into the calculator for M.6 Design for Disassembly to determine the percentage of total cost of materials designed for disassembly.
- Prepare all applicable documentation.

5.6.6.2 Calculator

A. Inputs

Materials Inputs Sheet

- Input in this section the costs of materials considered in the different materials criteria, as per the CSI materials classification. The Materials Input sheet includes cells for inputting all other materials that are not listed by default in the calculator's materials division numbers.
- If any of the materials to be considered is not in the list, use one of the blank lines within the corresponding Division.
- Use the 'Not broken-down materials' rows at the bottom of each Division and the Total Cost of MEP line to calculate the Total Cost of Materials for the park. Ensure the calculated Total Cost of Materials for each division matches those in the BOQ of the project.

Materials Designed for Disassembly Inputs

- Input the cost of materials designed for disassembly.

B. Calculations

Materials Input Sheet Calculations

- Sub-total Cost of Materials per Division = sum of the Costs of Materials per Division, including the lump sums (Not Broken-Down Materials).

Materials Designed for Disassembly Calculations

- Total cost of materials (excluding MEP) = sum of the sub-total cost of materials per division excluding MEP.
- Sub-total cost of materials designed for disassembly per division = sum of the cost breakdown of materials designed for disassembly.
- Total cost of materials designed for disassembly = sum of the sub-total costs of materials designed for disassembly per division.
- (X) = calculated value based on the percentage of total cost of materials designed for disassembly over the total cost of construction materials, excluding MEP.
- M.6 criterion level = the generated criterion level for M.6 Design for Disassembly based on the specified range from the criterion levels.

5.7 [M.7] RESPONSIBLE SOURCING OF MATERIALS

5.7.1 PURPOSE

To use certified responsibly sourced materials.

5.7.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the number of products and materials with GSAS approved certification for responsibly sourced materials.
- The Project will complete the ***calculator*** for M.7 Responsible Sourcing of Materials to establish the ***criterion level***.

5.7.3 ASSESSMENT

The criterion requires ***assessing*** the responsibly sourced materials with GSAS approved certificates.

To be considered in the assessment, materials should comply with the Certification Body approved scheme for responsible sourcing of materials guided by regionally or internationally recognized standards, such as BS8902:2009 or equivalent.

Timber products should be sourced from sustainably managed forests to be considered in the assessment. Suppliers must hold Forest Stewardship Council (FSC) Chain of Custody Certification.

The ***calculator*** determines the indicator based on the numbers of responsibly sourced materials used in the project.

The ***criterion level*** is established based on the result of the indicator for M.7 Responsible Sourcing of Materials.

5.7.4 CRITERION LEVELS

Levels	Responsible Sourcing (X) Indicator
0	X = 0
1	X = 1
2	X = 2
3	X = 3

5.7.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	List and certificates of the responsibly sourced materials.
	Relevant specifications describing the responsibly sourced materials.
Calculator	M.7 Responsible Sourcing of Materials Calculator.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	If applicable, updated list and certificates of the responsibly sourced materials.
	Evidence of the use of responsibly sourced materials on site, such as Materials Approval Requests.
Calculator	Updated M.7 Responsible Sourcing of Materials Calculator.

5.7.6 EVALUATION

5.7.6.1 General

- Determine the relevant responsibly sourced materials.
- Input the data into the calculator for M.7 Responsible Sourcing of Materials to determine the number of responsibly sourced materials and the additional incentives.
- Prepare all applicable documentation.

5.7.6.2 Calculator

A. Inputs

Inputs for Responsibly Sourced Materials

- Input the descriptions of responsibly sourced materials with GSAS approved certificates.
- Input the title of GSAS approved certificates of the responsibly sourced materials.

B. Calculations

- (X) = number of responsibly sourced materials.
- M.7 criterion level = the generated criterion level for M.7 Responsible Sourcing of Materials based on the specified range from the criterion levels.
- Incentive score (%) = 0.50% for 1 material, and 0.25% per additional material, up to a maximum of 1%.

6.0 CULTURAL & ECONOMIC VALUE

The Culture & Economic Value category is concerned with the cultural impacts in the design of the built environment and support of the national economy.

The architecture of the built environment can contribute towards the preservation of local cultural identity and heritage. Design expression should align with and integrate the development into the existing cultural fabric. In addition, the use of local materials and local workforce contributes towards the growth of the national economy.

CRITERIA IN CULTURAL & ECONOMIC VALUE CATEGORY:

CE.1 Heritage & Cultural Identity

CE.2 Support of National Economy

CRITERIA SUMMARY

The table below summarizes the weights of the Cultural & Economic Value category and each of the associated criteria:

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
CE	**CULTURAL & ECONOMIC VALUE**				
CE.1	Heritage & Cultural Identity	-1	3	1.62%	-
CE.2	Support of National Economy	-1	3	2.38%	-
			Total	**4.00%**	**0.00%**

6.1 [CE.1] HERITAGE & CULTURAL IDENTITY

6.1.1 PURPOSE

To encourage design expression in alignment with heritage and cultural identity.

6.1.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the design expression for alignment with heritage and cultural identity.
- The Project will prepare a ***concept brief*** and relevant design information to establish the ***criterion level***.

6.1.3 ASSESSMENT

The criterion requires ***assessing*** the design of the park by reviewing and verifying the concept brief that demonstrates the alignment of design strategies and reflection of design expressions with heritage and cultural identity.

The ***concept brief*** and presentation materials demonstrate any of the following requirements:

- Design strategies that meet the enhancement, strengthening, and reflection of heritage and cultural identity of the region.
- Design expressions that harmonize with cultural values and traditions of the people.

Level 3 target requires a formal request from the development to convene the Expert Heritage Panel (EHP) for the evaluation of the submittals. Level 2 requires formal request from the development to obtain clearance from the Authority Having Jurisdiction (AHJ) to submit for evaluation.

The ***criterion level*** is established based on the degree of compliance of the concept brief and presentation materials to the requirements of CE.1 Heritage & Cultural Identity.

6.1.4 CRITERION LEVELS

Levels	Requirements
-1	Design expressions do not conform to GSAS Trust evaluations.
0	Design expressions generally conform to GSAS Trust evaluations.
1	Design expressions and submittals conform to GSAS Trust evaluations.
2	Design expressions and submittals conform to the evaluations of the Authority Having Jurisdiction or to the Expert Heritage Panel.
3	Design expressions and submittals conform to the evaluations of the Expert Heritage Panel.

6.1.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	Concept design brief.
	Relevant architectural design drawings and presentation materials.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	As-built architectural design drawings.

6.1.6 EVALUATION

6.1.6.1 General

- Determine the targeted Level for the assessment and notify GORD of the project intention to pursue the targeted Level.
- Identify strategies to strengthen or enhance cultural identity:
  - Conduct research into the cultural identity and traditions of the region.
  - Consult, if necessary, a local heritage expert for further recommendations and detailed guidance on the proposed design.
  - Demonstrate how the urban planning, site development, form and layout, use of space, lighting, selection of materials, and overall aesthetic quality of the development reflect the heritage and cultural identity of the region.
  - Determine the architectural design expressions that align with and strengthen the cultural values and traditions of the region.
  - Ensure the proposed design will not degrade the cultural character of any existing development on adjacent properties.
  - Study the existing fabric when designing the features and components of the new park.
  - Illustrate in the presentation narrative and materials, which can include 3-D renderings, how the design meets the requirements of the criterion and where applicable:
    - The relationship of the park to the wider context of the city and the immediate neighborhood
    - The sequence and experience of arrival.
    - How the park will be used by occupants and visitors.
    - Features of specific interest associated with the criterion.
- Prepare all applicable documentation.

6.2 [CE.2] SUPPORT OF NATIONAL ECONOMY

6.2.1 PURPOSE

To maximize the value of construction expenditures benefitting the national economy.

6.2.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the value of the construction expenditures for local goods and services benefitting national economic growth.
- The Project will complete the ***calculator*** for CE.2 Support of National Economy to establish the ***criterion level***.

6.2.3 ASSESSMENT

The criterion requires ***assessing*** the construction expenditures of the development that benefit the national economy and support economic growth. Construction expenditures include the fees and costs of:

- Professional and consultancy services
- Contractors and subcontractors
- Building and construction materials
- Construction tools, equipment, and machineries
- Temporary facilities and rental spaces
- Other miscellaneous expenditures

The ***calculator*** determines the indicator based on the percentage of construction expenditures that benefit the national economy.

The ***criterion level*** is established based on the result of the indicator for CE.2 Support of National Economy.

6.2.4 CRITERION LEVELS

Levels	Percentage of Construction Expenditures that Benefit the National Economy (X) Indicator
-1	X < 10%
0	10% ≤ X < 30%
1	30% ≤ X < 40%
2	40% ≤ X < 50%
3	X ≥ 50%

6.2.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Intended list of local suppliers/subcontractors.
	Evidence of supplier/subcontractor being local, such as the Commercial Registration.
	Evidence of cost estimation per supplier/subcontractor, such as excerpts of the Bill of Quantities.
	Evidence of the Total Construction Cost, such as excerpts of the Bill of Quantities.
Calculator	CE.2 Support of National Economy Calculator

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Evidence of supplier/subcontractors being hired for the project, such as Material Approval Requests and Subcontractors Approval Requests.
	Evidence of cost related to supplier/subcontractor, such as excerpts of the Bill of Quantities.
	Updated Commercial Registrations, when applicable.
Calculator	Updated CE.2 Support of National Economy Calculator

6.2.6 EVALUATION

6.2.6.1 General

- Identify in the design documents goods and services potentially provided by local companies.
- Search in the local market companies that can provide goods and services suitable for the project.
- Determine from the design documents the total construction costs.
- Input the data into the calculator for CE.2 Support of National Economy to determine the percentage of construction expenditures that benefit the national economy.
- Prepare all applicable documentation.

6.2.6.2 Calculator

A. Inputs

National Construction Expenditures Inputs

- Input the name of local suppliers/subcontractors and the description of the related goods/services in the correspondent section among:
  - Professional Services/consultations
  - Contractors/Subcontractors
  - Building Materials
  - Construction Tools/Equipment/Machinery
  - Temporary Facilities
  - Others
- Input the cost associated with the supplier/subcontractor.
- Input the total construction cost (labor, equipment, and materials, etc.).

B. Calculations

- Total cost of the national construction elements = sum of the construction expenditures that benefit the national economy.
- (X) = calculated percentage of construction expenditures that benefit the national economy.
- CE.2 criterion level = the generated criterion level for CE.2 Support of National Economy based on the specified range from the criterion levels.

7.0 MANAGEMENT & OPERATIONS

The Management & Operations category is concerned with the design of the development for use during the operational phase. The development should plan for and implement sustainable and effective building management and operations practices.

Sustainable building management and operations can mitigate environmental impacts such as water depletion, materials depletion and human comfort and health.

CRITERIA IN MANAGEMENT & OPERATIONS CATEGORY:

MO.1 Systems Commissioning

MO.2 Waste Management

MO.3 Facility Management

MO.4 Leak Detection Systems

MO.5 Safety & Security

MO.6 Landscape Maintenance

MO.7 Sustainability Awareness

CRITERIA SUMMARY

The table below summarizes the weights of the Management & Operations category and each of the associated criteria:

NO	CATEGORY / CRITERION	LEVELS		WEIGHTS (%)	INCENTIVE WEIGHTS
		MIN	MAX		
MO	**MANAGEMENT & OPERATIONS**				
MO.1	Systems Commissioning	0	3	0.92%	2.00%
MO.2	Waste Management	0	3	3.95%	2.00%
MO.3	Facility Management	0	3	1.23%	2.00%
MO.4	Leak Detection Systems	0	3	0.49%	-
MO.5	Safety & Security	0	3	1.92%	-
MO.6	Landscape Maintenance	0	3	1.81%	-
MO.7	Sustainability Awareness	0	3	2.68%	-
			Total	**13.00%**	**6.00%**

7.1 [MO.1] SYSTEMS COMMISSIONING

7.1.1 PURPOSE

To develop and implement a commissioning process that ensures the delivery and performance of the systems within the park.

7.1.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the testing, adjusting, balancing, and commissioning in addition to training requirements associated with the Project systems.
- The Project will prepare relevant commissioning ***plan*** or ***report*** to establish the ***criterion level***.

7.1.3 ASSESSMENT

The criterion requires ***assessing*** the commissioning of the park systems which include, but not limited to, HVAC systems, lighting systems and controls, electrical systems, water-use systems and renewable energy systems. The assessment considers measures associated with systems planning, design, installation, testing and operations under projected occupancy loads and conditions.

The commissioning ***plan*** is a comprehensive document that outlines the commissioning process and the facilities to be commissioned. Commissioning process means a quality-oriented process that meets the requirements for assessing and documenting the commissioning anywhere throughout the design and construction phases of the park.

The commissioning plan demonstrates the following requirements:

- Establishment of Commissioning Scope
- Establishment of Commissioning Program
- Establishment of Commissioning Schedules
- Establishment of Testing and Inspection Plans
- Development of Commissioning Specifications
- Determination of Special Testing Needs
- Determination of Operational Staff Training Needs

Alternatively, a commissioning ***report*** documents the limited scope of commissioning which is conducted at the final stages of the construction. The report covers the commissioning of main MEP systems in the park based on the owner or developer requirements.

The commissioning report demonstrates the following requirements:

- Records of the calibrations of the instruments and devices used for commissioning the performances of the systems.
- Records and analyses of the collected data of the performances of the systems.
- Signed-off forms and templates of the Testing & Commissioning (T&C) and Testing, Adjusting & Balancing (TAB) reports.

In addition, GSAS accredited third-party Commissioning Agent (CxA) contracted by the owner or developer prepares and leads the comprehensive GSAS commissioning plan throughout the design and construction phases in collaboration with the consultants, contractors, and operator of the facilities. The CxA develops the OPR as part of the commissioning plan, in conjunction with the project owner and ensures the requirements are quantifiable and measurable to verify that the development objectives will be achieved.

The ***criterion level*** is established based on the degree of compliance of the plan or report to the requirements of MO.1 Systems Commissioning.

7.1.4 CRITERION LEVELS

Levels	Requirements
0	Plan or Report does not demonstrate compliance with the requirements.
1	Report demonstrates compliance with the requirements for MEP systems.
2	Plan demonstrates compliance with the requirements for all systems.
3	Plan demonstrates compliance with the requirements for all systems by GSAS accredited commissioning agent (CxA).

7.1.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Document	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Commissioning Specification.
	List of the facilities to be commissioned.
Plan	For levels 2 and 3, Commissioning Plan including relevant forms and templates for the T&C and TAB Reports.

Final Certification Stage (CDA)	
Types	**Descriptions**
Document	A narrative explaining any updates or changes in the criterion assessment.
	Updated Commissioning Specification, when applicable.
Plan	For levels 2 and 3, Updated Commissioning Plan, when applicable.
Report	For level 1, Commissioning Report
	Relevant T&C and TAB Reports of the results of the system commissioning.

7.1.6 EVALUATION

7.1.6.1 General

- Confirm the provision of a commissioning report or plan that outlines the scope of works and process adopted for commissioning.
- Determine the systems to be commissioned.
- Illustrate in the presentation materials or diagrams the commissioning process adopted for the design, construction, and operations of the facilities.
- Prepare all applicable documentation.

7.2 [MO.2] WASTE MANAGEMENT

7.2.1 PURPOSE

To provide measures for the implementation of waste management best practice during the post-occupancy phase.

7.2.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the measures implemented for managing organic waste and recyclable materials on- or off-site.
- The Project will prepare a waste management ***plan*** to establish the ***criterion level***.

7.2.3 ASSESSMENT

The criterion requires ***assessing*** the best practices adopted for the management of the wastes produced by the development by preparing a waste management plan. The plan includes the measures and strategies to be implemented for the proper handling and disposal of organic waste, composting and recyclable materials of the park.

The waste management ***plan*** is a document that outlines the plan for managing waste produced during the post-occupancy stage of the development.

The plan demonstrates the following requirements:

- System for the collection and transfer of organic waste
- System for collection, segregation and transfer of recyclable waste.
- Provision for ventilation of facilities for the storing and sorting of wastes prior to its final disposal.
- Process for composting the organic waste and recycling of materials on- or off-site.

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of MO.2 Waste Management.

7.2.4 CRITERION LEVELS

Levels	Requirements
0	Plan does not demonstrate compliance with the requirements.
1	Plan demonstrates compliance with the requirements of collection, storage, and final disposal of waste.
2	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

7.2.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant design drawings and specifications of waste storage and collection area/s.
	Relevant design drawings and specifications of composting facilities on-site, when applicable.
	Evidence of contractually binding commitment to composting organic waste off-site, when applicable.
	Evidence of contractually binding commitment to recycling waste off-site, when applicable.
	Relevant waste management process diagram.
Plan	Waste Management Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant updated specifications of waste storage and collection areas/s and on-site composting facilities, when applicable.
	Relevant as-built drawings.
Plan	Updated Waste Management Plan, when applicable.

7.2.6 EVALUATION

7.2.6.1 General

- Partial compliance for this criterion is associated with the plan demonstrates compliance with the requirements of collection, storage, final disposal of waste and either the composting requirements of organic waste OR the recycling requirements of the recyclable waste on- or off-site.
- Full compliance for this criterion is associated with the plan demonstrates compliance with the requirements of collection, storage, final disposal of waste and both the composting requirements of organic waste AND the recycling requirements of the recyclable waste on- or off-site.
- Confirm the provision of a waste management plan.
- Illustrate in the design drawings the facilities for the collection, storage, and segregation of the organic waste and recyclable waste.
- Illustrate in the design drawings the facilities for the on-site composting facilities, when applicable.
- Obtain from the owner contractually binding commitment documents for off-site composting, when applicable.
- Obtain from the owner contractually binding commitment documents for off-site recycling of waste.
- Prepare all applicable documentation.

7.3 [MO.3] FACILITY MANAGEMENT

7.3.1 PURPOSE

To provide measures for the implementation of facility management best practice during the operational phase.

7.3.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the measures implemented for the management, operation, and maintenance of the park.
- The Project will prepare a facility management ***plan*** to establish the ***criterion level***.

7.3.3 ASSESSMENT

The criterion requires ***assessing*** the best practices adopted for the operational management of the park and the upkeep of the property assets of the park by preparing a facility management plan.

The facility management ***plan*** is a document that outlines the sustainable approach to the strategic management process for operating and maintaining the park. A sustainable approach indicates there is a comprehensive model followed for strategic planning.

The plan demonstrates the following requirements:

- Provisions required for proper housekeeping of the park operations including janitorial, help desk support, storing facility, security, etc.
- Provisions required for proper operation and maintenance of the park including maintenance, access control, surveillance, MEP associated services, etc.

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of MO.3 Facility Management.

7.3.4 CRITERION LEVELS

Levels	Requirements
0	Plan does not demonstrate compliance with the requirements.
1	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

7.3.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant schematics, diagrams, and illustrations.
	Relevant forms and templates.
	Lists of green supply chains and management standards.
Plan	Facility Management Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings and specifications.
	Relevant handover documents showing the updates to the previous LOC stage submittals.
	Proof of contractually binding commitment from the Client stating the targeted GSAS-OP certification.
Plan	Updated Facility Management Plan, when applicable.

7.3.6 EVALUATION

7.3.6.1 General

- Partial compliance for this criterion demonstrates that the facility management plan is meeting the requirements of either soft OR hard facility management services.
- Full compliance for this criterion demonstrates that the facility management plan is meeting the requirements of both soft AND hard facility management services.
- Confirm the provision of a facility management plan for the post-occupancy operational phase.
- Illustrate in the presentation material the comprehensive model of the strategic management process followed for the strategy formulation, implementation, and evaluation of the facility operations.
- Prepare all applicable documentation.

7.4 [MO.4] LEAK DETECTION SYSTEMS

7.4.1 PURPOSE

To install leak detection systems for major water supply and refrigerant pipes.

7.4.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the installation of:
  - A leak detection system in the major water supply lines.
  - A refrigerant leak detection system in the air-conditioning systems.
- The Project will prepare a leak detection ***plan*** to establish the ***criterion level***.

7.4.3 ASSESSMENT

The criterion requires ***assessing*** the systems for detecting refrigerant leaks in refrigeration installations and water leaks in major water supply lines and irrigation lines by preparing a leak detection plan. The refrigeration installations that requires refrigerant leak detection system are the refrigeration systems that use stratospheric ozone-depleting substances such as the, walk-in coolers and freezers, air conditioning equipment and refrigerated display cabinets. The major water supply lines that requires water leak detection system are the water supply mains and irrigation systems lines to the park and the main distribution lines to the wet areas such as the showers and washrooms, ablutions, water filtration and pump rooms, and water tank rooms.

The leak detection ***plan*** is a document that outlines the development's plan for the systems for automatic detection of refrigerant and water leaks.

The plan demonstrates the following requirements:

- Provision of a system for the automatic detection of the refrigerant leaks in the air-conditioning and refrigeration equipment.
- Provision of a system for the automatic detection of the water leaks in the water supply and irrigation mains and distribution lines.
- Layouts, schematics, sequence of operations, and specifications to understand the functionalities of the provided leak detection systems.
- Training schedules and modules for the facility management personnel on the proper operations and maintenance of the leak detection systems.

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of MO.4 Leak Detection Systems.

7.4.4 CRITERION LEVELS

Levels	Requirements
0	Plan does not demonstrate compliance with the requirements.
1	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

7.4.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant design drawings, diagrams, and specifications.
	Where applicable, the BMS schedule of points and control system showing the leak detection system integration with the BMS.
Report	Relevant commissioning reports
Plan	Leak Detection Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant construction drawings, diagrams, and specifications.
	Relevant as-built drawings.
Plan	Updated Leak Detection Plan, when applicable.

7.4.6 EVALUATION

7.4.6.1 General

- Partial compliance for this criterion demonstrates the installation of leak detection system for major water supply lines OR refrigeration installations.
- Full compliance for this criterion demonstrates the installation of leak detection system for major water supply lines AND refrigeration installations.
- Confirm the provision of a system for detecting refrigerant leaks in the air-conditioning and refrigeration installations.
- Confirm the provision of a system for detecting water leaks in the water supply mains and distribution lines.
- Illustrate in the presentation material the reliability of the chosen leak detection systems to provide real time responses to refrigerant and water leaks.
- Ensure that leak detection systems meet the following requirements:
  - Be capable of detecting higher than normal flow rates at water meters for longer than a pre-set period of time.
  - Be capable of identifying various levels of leakage rates.
  - Be programmable and adjustable.
  - Be clearly audible.
  - Minimize the possibility of false alarms.
  - Provide refrigerant recovery system where necessary.
- Prepare all applicable documentation.

7.5 [MO.5] SAFETY & SECURITY

7.5.1 PURPOSE

To provide a safe and secure environment for all park users.

7.5.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the provided security measures that is designed to deter crime.
- The Project will prepare a Safety & Security ***plan*** to establish the ***criterion level***.

7.5.3 ASSESSMENT

The criterion requires ***assessing*** the methods and measures provided to deter crime within the boundary of the park.

The plan can include, but is not necessarily limited to the following:

- Clearly defined and visible operating hours of the park posted at all park entrances.
- Clearly defined and visible park rules, regulations and restrictions posted at all park entrances.
- Clearly marked park boundaries with adjacent sites.
- The intent to maintain clear sight lines throughout the park to ensure park users can be seen by other users, staff and people passing the park site.
- Posting up to date contact information for the relevant authorities in the event of an incident, crime or suspicious behavior. The information posted shall include the name of the organization to contact, telephone number(s) and instructions on how to contact the relevant authorities at any time.
- Minimizing possible entrapment areas or spaces that are cordoned off on three sides thus limiting visibility.

For medium to large parks the Safety & Security Plan shall also include the following:

- Provision for regular patrols by either police officers, private security or security employed directly by the park operator.
- Details of the patrolling force, the frequency and schedule of the patrols and a copy of any agreement or contract with any third-party security company.

For large parks the Safety & Security Plan shall also include the following:

- Provision for a network of emergency call points on pathways and roads.
- CCTV surveillance recording equipment that observes all park entrances, monuments and spaces designed for large number of people to congregate, concealed pathways and other public facilities.

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of MO.5 Safety & Security.

7.5.4 CRITERION LEVELS

Levels	Requirements
0	Plan does not demonstrate compliance with the requirements.
1	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

7.5.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant supporting information.
	Relevant design drawings if applicable.
Plan	Safety & Security Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant updated supporting information.
	Relevant as-built drawings if applicable.
Plan	Updated Safety & Security Plan, when applicable.

7.5.6 EVALUATION

7.5.6.1 General

- Partial compliance for this criterion shall demonstrates compliance with two of the security measures outlined above.
- Full compliance for this criterion shall demonstrate full compliance with all the security measures outlined above.
- Prepare all applicable documentation.

7.6 [MO.6] LANDSCAPE MAINTENANCE

7.6.1 PURPOSE

To encourage landscape planning for the ongoing ecological management of habitats and species to protect the natural environment.

7.6.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the implementation of a Landscape Maintenance Plan to conserve habitats and biodiversity and to maintain lawns and vegetation within the project boundaries upon completion.
- The Project will prepare a Landscape Maintenance ***plan*** to establish the ***criterion level***.

7.6.3 ASSESSMENT

The criterion requires ***assessing*** the best practices adopted for the maintenance of the landscaping by preparing a landscape maintenance plan. The plan includes the method by which the landscape will be allowed to develop, defining long-term design objectives and management responsibilities for all landscape areas. The plan will include maintenance tasks including weed control, pest and disease control, thinning, splitting perennials, pruning, planting replacement, fertilizing, mulching, watering, tree firming, stake removal and crown pruning and lifting on trees.

The criterion requires ***developing*** a Landscape Maintenance Plan for future implementation that includes the following requirements:

- Clear goals, both short- and long-term landscape objectives and how these goals will be achieved. Including when, where and how maintenance should be carried out, taking into account the habitat and species present and their demands. Furthermore, subject such as fertilization, seeding and planting, preventing soil erosion, irrigation and pest control should be addressed.
- A framework of measures to monitor the maintenance progress.
- The responsibilities for both the implementation and execution of the Landscape Maintenance Plan are allocated within the appropriate organizations.

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of MO.6 Landscape Maintenance Plan.

7.6.4 CRITERION LEVELS

Levels	Requirements
0	Plan does not demonstrate compliance with the requirements.
1	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

7.6.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant landscape drawings and specifications
	Softscape material data sheets.
Plan	Landscape Maintenance Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant supporting information.
	Relevant as-built drawings.
Plan	Updated Landscape Maintenance Plan, when applicable.

7.6.6 EVALUATION

7.6.6.1 General

- Partial compliance for this criterion shall demonstrates compliance with two of the landscape initiatives outlined above.
- Full compliance for this criterion shall demonstrate full compliance with all the landscape initiatives outlined above.
- Identify the landscape areas and landscape components on the site. If there are invasive species and toxic plants in the list, proper mitigating measures should be provided.
- All of the landscape and ecological areas of the site, except for private gardens, will be subject of the Landscape Maintenance and Management Plan.
- The Landscape Management Plan shall be monitored and evaluated for their effectiveness on an annual basis for the first five years upon completion of the park.
- Prepare all applicable documentation.

7.7 [MO.7] SUSTAINABILITY AWARENESS

7.7.1 PURPOSE

To promote and educate employees, visitors, and the wider community about sustainable initiatives and programs associated with the park.

7.7.2 ASSESSMENT PRINCIPLES

- The Project will ***assess*** the promotion of sustainable initiatives and design features associated with the park.
- The Project will prepare a Sustainability Awareness ***plan*** to establish the ***criterion level***.

7.7.3 ASSESSMENT

The criterion requires ***assessing*** the methods and measures to implement sustainability awareness for employees, visitors and the wider community. The Project will develop a Sustainability Awareness Plan to promote the sustainability initiatives associated with the park.

The plan can include, but is not necessarily limited to the following:

- Events and competitions, awards and park tours, etc.
- Printed material, including brochures, flyers and posters promoting sustainability initiatives within the park.
- Media production including educational films etc.
- Digital materials including social media, website and online campaigns etc.
- Displays and signages within the park supporting sustainability.

The ***criterion level*** is established based on the degree of compliance of the plan to the requirements of MO.7 Sustainability Awareness.

7.7.4 CRITERION LEVELS

Levels	Requirements
0	Plan does not demonstrate compliance with the requirements.
1	Plan demonstrates partial compliance with the requirements.
3	Plan demonstrates full compliance with the requirements.

7.7.5 SUBMITTALS

Provisional Certification Stage (LOC)	
Types	**Descriptions**
Documents	A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
	Relevant supporting information.
	Relevant design drawings if applicable.
Plan	Sustainability Awareness Plan.

Final Certification Stage (CDA)	
Types	**Descriptions**
Documents	A narrative explaining any updates or changes in the criterion assessment.
	Relevant updated supporting information.
	Relevant as-built drawings if applicable.
Plan	Updated Sustainability Awareness Plan, when applicable.

7.7.6 EVALUATION

7.7.6.1 General

- Partial compliance for this criterion shall demonstrates compliance with two of the sustainability initiatives outlined above.
- Full compliance for this criterion shall demonstrate full compliance with all the sustainability initiatives outlined above.
- Prepare a strategy plan based on consultation with the developer and stakeholder, to indicate the included sustainability initiatives considered by the development.
- Prepare all applicable documentation.

TERMS AND ABBREVIATIONS

A	
ADPI	Air Diffusion Performance Index
ADT	Average Daily Trips
ASHRAE	The American Society of Heating, Refrigerating, and Air-Conditioning Engineers

B	
BOQ	Bill of Quantities

C	
Carcinogenic	Material substances agents with properties known to promote cancer.
CDA	Conformance to Design Audit
CDA stage	The stage of GSAS certification for obtaining the final certificate.
CIBSE	Chartered Institution of Building Services Engineers
Criterion level	The established level of the assessed criterion for meeting the requirement of Level (-1), (0), (1), (2), or (3).

D	
Development	The real estate development or the site development or the building project.
DGI	Daylight Glare Index
DNL	Day-Night Sound Level

E	
Eco-labeling	Labeling of products and materials with enhanced environmental, health and resources conservation attributes.
ETS	Environmental Tobacco Smoke

G	
GORD	Gulf Organisation for Research & Development
Green transportation	Mode of transportation that does not rely on fossil fuel.
GSAS	Global Sustainability Assessment System

GSAS commissioning plan	In systems commissioning, it means a comprehensive document that outlines the commissioning process and the facilities to be commissioned.
GSAS-CM	GSAS Construction Management

I	
IESNA	Illuminating Engineering Society of North America
Illuminance	The measure of the amount of light received on a surface.
Indicator	(X), (Y) and (Z) in the criterion level.
Indicator result	The values of (X), (Y) and (Z) indicators.

L	
Light trespass	Obtrusive light which causes annoyance, discomfort, distraction, or reduction in visibility.
LOC	Letter of Conformance
LOC stage	The stage of GSAS certification for obtaining the LOC.

M	
MDS	Material Data Sheet
MEP	Mechanical, Electrical and Plumbing
MEPF	Mechanical, Electrical, Plumbing and Fire Protection

P	
PMV	Predicted Mean Vote
Project, the	The project stakeholders including client, design team and consultants.

R	
Reflectance	The ratio of the amount of light reflected by a surface over the total amount of light incident on the surface.

S	
Sustainable approach	In facility management plan, it means there is a comprehensive model followed for strategic planning.
Sustainable parking spaces	In eco-parking, it means parking types are designed and built with sustainable techniques.

Sustainable techniques	In eco-parking, it means techniques that mitigate the negative impacts of heat island effect, rainwater runoff and other open hardscapes with no shadings

T	
TAB	Testing, Adjusting and Balancing
T&C	Testing and Commissioning
Transmittance	The ratio of the amount of light passing through the surface over the total amount of light incident on the surface.

U	
ULE	Upward Light Emission

V	
VOC	Volatile Organic Compound

END USER'S AGREEMENT TO THE TERMS AND CONDITIONS OF USE OF THIS MANUAL

The use of this assessment manual is governed by the end user's agreement to the following terms and conditions.

This manual is designed, developed and maintained by the Gulf Organisation for Research & Development (GORD) with business address located in Doha, State of Qatar.

Careful attention to details were exerted in the creation of this manual to ensure the accuracy, clarity, and relevancy of the contents. However, the same should not be construed as a statement of law or used for any legal purposes.

For any clarifications or inquiries, users are advised to verify or check with GSAS Trust, a division of GORD with website address at www.gord.qa, and to obtain appropriate professional advice.

GORD or any of its centers of excellence, under any circumstances be liable for any cost, expense, loss, or damage from the use or loss of use of the information in this manual.

Dispute or claim in connection with the use or loss of use of the information contained in this manual are subject to the jurisdiction of the courts in the State of Qatar.

The information contained in this manual could include pointers or links to information created and maintained by non-Government or private organizations.

GORD is providing these links and guides solely for your information and convenience.

External sources are subject to the privacy and security policies of its owners/sponsors and are outside GORD's domain.

GORD does not guarantee the availability of such outside sources or linked pages at all times.

GORD cannot authorize the use of copyrighted materials contained in external sources or linked websites.

Users are advised to request such authorization from the owner of the outside sources or related sites.

GORD does not provide any guarantees on the accuracy, currency, and relevancy of the pointed or linked information from external sources.

By proceeding to download or receive this manual, you now agree to be bounded by the terms and conditions of use set forth in this manual.

Building Sustainably

GORD
المنظمة الخليجية للبحث والتطوير
Gulf Organisation for Research & Development

Gulf Organisation for Research and Development
T: +974 4404 9010, F: +974 4404 9002
Qatar Science & Technology Park (QSTP)
Tech 1, Level 2, Suite 203
P.O. Box: 210162, Doha, Qatar

www.gord.qa