



Building Sustainably

GSAS CONSTRUCTION MANAGEMENT ASSESSMENT MANUAL

FOR BUILDINGS AND INFRASTRUCTURE



Dr. Yousef Alhorr, Founding Chairman

4th Edition



اللجنة العليا
للمشاريع والبراث
Supreme Committee
for Delivery & Legacy



GSAS

PUBLICATIONS SERIES

GSAS CONSTRUCTION MANAGEMENT: ASSESSMENT MANUAL FOR BUILDINGS AND INFRASTRUCTURE

4th Edition

Dr. Yousef Mohammed Alhorr
Founding Chairman

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Founding Chairman



The UN Urbanization Prospects Report 2014 states that 54 percent of the world's population is residing in urban areas, and by 2050, 66 percent 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, it also determines the quality of life and how human wellbeing is taken care of. As most of our time is spent in buildings and 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 recognizes the pioneering efforts of the developers, contractors, practitioners and 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 on sustainable development of the region 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 continually reviewed 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 take it into new dimensions. Finally, the continuous support from Qatari Diar Real Estate Company (QD) and the Supreme Committee for Delivery and Legacy (SC) are highly appreciated, and without their support, GSAS would not be able to achieve what it has done in such a short space of time.

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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 master planning, 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 predesign to post-occupancy.

The objective of GSAS Construction Management (GSAS-CM) is to evaluate the sustainability impact of building or infrastructure project over the course of the construction phase. It assesses the aspects of the construction processes and on-site practices that have a lasting sustainability impact and provides a framework to perform measurements in line with normative standards and accepted practices to consider those impacts the project can mitigate.

GSAS-CM is used to assess the processes and practices of contractors in the construction of buildings, mixed use developments and districts & infrastructure and irrespective of whether GSAS Design and Build certification is pursued for these projects or not. GSAS-CM benefits from best practices employed by the construction industry taking into consideration the specific ecological and environmental context of the region.

Although GSAS-CM can be used for different types of projects using the same processes and measurement principles, there may be differences among the project types depending upon different applicability of criteria at each construction stage (enabling / foundation stage; superstructure stage; and, finishing stage), types of measurements required within a particular criterion, and specific reference values or scoring thresholds. Since the assessment involves audits at each construction stage, the nature of observations in Audit Advisory Notice (AAN) issued at each stage will also differ from criterion to criterion.

GSAS-CM framework is based on eight categories including: Urban Considerations [UC], Site [S], Energy [E], Water [W], Materials [M], Outdoor Environment [OE], Socio-Cultural Dimension [SD] and Management & Operations [MO]. The categories are then broken down into specific criteria that measure and define individual issues related to environmental aspects. Each criterion has

associated guidelines to provide projects with descriptive information for consideration to help attain the targeted level. These suggestions are in the form of recommended methods and measures. Projects should consider and assess the potential advantages and benefits of the recommended methods and measures in relationship to the specific goals, requirements, and conditions of the project.

For a project, it is possible to target selected categories and criteria to achieve desired GSAS Class Rating. In order to incorporate the targeted GSAS-CM framework categories and criteria and to outline how a construction project will plan human, organizational, and communication resources and processes to meet the requirements of targeted GSAS-CM criteria, a GSAS Construction Management Plan (GSAS-CMP), shall be developed by contractor and assessed by GSAS-Trust. Appropriate submittals shall be made for assessment of evidence of compliance against each targeted GSAS-CM criterion as guided by GSAS-CMP.

The guidelines are not intended to provide specific or explicit instruction on how to manage construction activities sustainably, but rather to provide guidance and recommendations on how to approach the sustainability issues within each criterion. Furthermore, these guidelines are by no means inclusive of all possible recommendations. Thus, all projects are ultimately expected to perform the required research and analysis necessary for their specific conditions and goals to meet the sustainability requirements of GSAS.

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

CERTIFICATION OVERVIEW

1.0 INTRODUCTION

Construction has a direct impact on the natural environment, the economy, and human health. These aspects can be improved through sustainable construction methods and measures. The potential benefits of green building practices in construction are:

- Preserved ecosystems including lands and habitats.
- Optimized energy use and reduced greenhouse gas emissions.
- Optimized water use.
- Reusing and recycling of construction materials.
- Reduced construction waste.
- Improved outdoor environmental quality.
- Increased environmental awareness.

GSAS Construction Management (GSAS-CM) certification emphasizes the importance of optimum construction practices. The certification evaluates and rates how well the construction site is managed to achieve the above-mentioned benefits with the highest levels. The assessment of construction management is a process that can evaluate the sustainability performance of a construction site during its temporary lifetime.

2.0 SCOPE AND APPLICABILITY

GSAS-CM addresses the management of all types of construction sites, from a single building, large buildings with multiple zones to infrastructure projects of different scales.

3.0 CATEGORIES AND CRITERIA

GSAS-CM consist of eight categories, which address different aspects of construction practices and outline the ways in which contractors can sustainably mitigate the negative impacts. These categories are divided into specific criteria that define individual sustainability issues. Each criterion specifies a process for measuring parameters related to sustainability impacts and for documenting the degree to which the requirements have been met. A level is then awarded to each criterion based on the degree of compliance.

General description of the categories is provided below:

Urban Considerations [UC]

The Urban Considerations category considers aspects related to traffic management, drain and stormwater contamination and waterbody contamination.

Site [S]

The Site category considers aspects related to preservation of land and biodiversity, and control of erosion, sediment, earthworks and dewatering.

Energy [E]

The Energy category considers aspects related to management of energy use during the construction process, both in temporary buildings on-site and plant and equipment utilized for the construction activities.

Water [W]

The Water category considers aspects related to water management for domestic and non-domestic applications.

Materials [M]

The Materials category considers aspects related to the diversion of existing waste from landfill or incineration, eco-labeling of temporary construction and building materials and cut and fill optimization.

Outdoor Environment [OE]

The Outdoor Environment category considers aspects related to control of dust, noise, vibration control, light pollution, odor, VOCs emissions, and the visual impact of the construction site.

Socio-Cultural Dimension [SD]

The Socio-Cultural Dimensions category considers aspects related to cultural conservation, protection of archeological remains and heritage sites, and interaction with the local community and stakeholders of the project.

Management & Operations [MO]

The Management & Operations category considers aspects related to waste management, welfare facilities, construction health & safety and Workers accommodation.

4.0 CONSTRUCTION STAGES

The project construction practices are assessed across three different periods to ensure compliance with sustainability best practices throughout the construction phase. The three different construction stages are:

- Enabling / Foundation Stages.
- Substructure & Superstructure Stage.
- Finishing Stage.

5.0 LEVELS, WEIGHTS, SCORES AND RATINGS

5.1 CRITERION LEVELS

The determination of the criterion level depends on the assessment approach which can take one of the following forms:

1. Performance-based assessment: where the criterion is assessed based on quantitative performance indicators associated with the implementation of sustainable methods and measures. The criterion level is determined by a calculator based on such indicators.
2. Prescriptive-based assessment: where the criterion is assessed based on qualitative performance indicators associated with the implementation of sustainable methods and measures. A report must be submitted by the project to demonstrate implementation of the methods and measures included in GSAS-CM Guidelines Manual. Compliance is achieved if the methods and measures have at least 80% degree of compliance, taking into consideration the justified hierarchy of the methods and measures, and the degree of implementation (none, low, moderate, high or not applicable) based on the significance of the sustainability impacts of the specific project under assessment. The criterion level is determined based on compliance to such indicators.
3. Mixed assessment: where the assessment is based on quantitative performance indicators and qualitative evaluation. In such instances the criterion level is determined based on the overall achievement of the two assessment methods.
4. Inherited-weight assessment: where the levels of some criteria under GSAS-CM Site category can be inherited from GSAS Design & Build (GSAS-D&B) corresponding criteria as indicated in the awarded Letter of Conformance (LOC). This is subject to confirmation that the construction project meets the requirements for the inherited level.

The criterion level is quantifiable on a scale of 0 to 3, where level 0 refers to “evidence not acceptable” or “requirements not attained” and levels 1 to 3 correspond to increasing improvements in the sustainability of the construction processes and practices.

5.2 CRITERION WEIGHTS

Each category and criterion have an associated weight based on the relative environmental, social and economic impact. The weight indicates the relative importance of the criterion in percentage. Overall weight of each category is determined by aggregation of the individual weights of criteria belonging to that category.

Incentive weights are allocated for certain GSAS-CM criteria to encourage additional efforts to implement best practices on sustainability.

5.3 CRITERION SCORES

Each criterion has an associated weight and once a level is assigned to the criterion, the value is multiplied by the weight and the score is determined.

5.4 CERTIFICATION RATINGS

- For each construction stage, an overall score is calculated as the sum of all criteria achieved scores. As the overall score for the three stages are assigned, the overall project score is calculated.
- Five performance-based criteria, namely E.1 Energy Use – Temporary Buildings, W.1 Domestic Water Use, M.1 Materials Diversion from Landfill, M.3 Cut & Fill Optimization and MO.1 Waste Management; are assessed on a cumulative basis. The calculator's inputs are based on the measurements from the commencement of the construction works. Therefore, for each of the five criteria, the achieved criterion levels in stages 1 and 2 will have a temporary status, and will not be considered when calculating the project overall score. The criterion level determined by the calculator in Stage 3 will automatically be considered in calculating the final overall score of the project. Apart from those five criteria, the overall project score is considering the average scores of the three construction stages.
- The project overall score always falls within the range of 0.00 to 3.00 and when incentive weights are added, the cumulative score upper limit remains at 3.00.
- The certification rating is awarded based on the overall score of the project. Construction Management certification has five ratings based on "Class" designation to reflect the construction practices impact (refer to Figure 1). The minimum acceptable rating for a construction project is Class D, with a minimum project overall score of 0.5. The highest rating a project can achieve is Class A* corresponding to a minimum project overall score of 2.5 (refer to Figure 2).

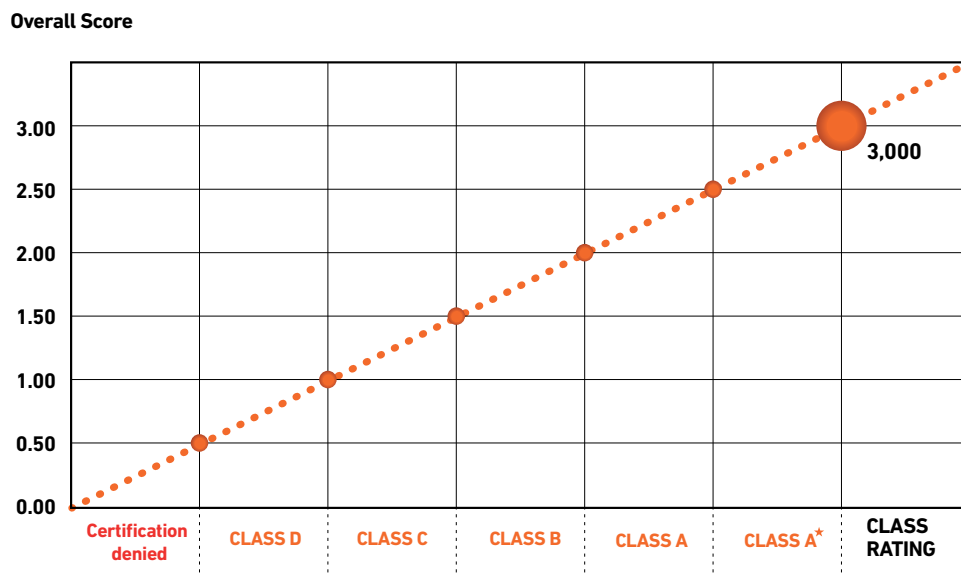


Figure 1: GSAS-CM Certification Ratings

Score	Certification Rating	GSAS-CM Certification
$X < 0.5$	-	CERTIFICATION DENIED
$0.5 \leq X < 1.0$	CLASS D	CERTIFICATION ACHIEVED
$1.0 \leq X < 1.5$	CLASS C	
$1.5 \leq X < 2.0$	CLASS B	
$2.0 \leq X < 2.5$	CLASS A	
$X \geq 2.5$	CLASS A★	

Figure 2: GSAS-CM Tabulated Certification Scores and Ratings

6.0 CERTIFICATION REQUIREMENTS

6.1 MANDATORY CRITERIA

- The following criteria are mandatory for all Classes to obtain GSAS-CM certification and a minimum level of 1 must be achieved in all three construction stages under each of these criteria:
 - [UC.1] Traffic Management.
 - [OE.1] Dust Control.
 - [OE.2] Noise & Vibration Control.
 - [MO.1] Waste Management.
 - [MO.3] Construction Health & Safety.
- Energy and Water categories are mandatory for projects targeting a “Class B” rating or higher. The minimum level to be achieved under each of these categories is 1, as described below:
 - [E.1] and [W.1] are performance-based criteria, in which parameters are measured on a cumulative basis from the commencement of the construction works; therefore, achieving at least level 1 in stage 3 is mandatory.
 - [E.2] and [W.2] are prescriptive criteria and a minimum level of 1 must be achieved in all three construction stages.
 - If the project fails to achieve the above minimum levels, the certification rating would be downgraded to class C or D as applicable.

6.2 GSAS-CMP PRE-REQUISITE

GSAS-CM requires development and submission of GSAS Construction Management Plan (GSAS-CMP) highlighting the targeted categories, criteria, rating, the management resources and processes required to meet the targets. The submission of the GSAS-CMP is a prerequisite for obtaining the certification.

6.3 CERTIFICATION DENIAL

Certification is denied, and the project does not receive certification if:

- The project GSAS-CMP is not submitted or does not demonstrate compliance with the requirements.
- The Project obtains a cumulative score below 0.5.
- The Project obtains a level below the mandatory minimum level in any of the five mandatory criteria.

7.0 CERTIFICATION PROCESS

7.1 REGISTRATION AND FEES

All projects aiming to obtain GSAS Construction Management certification will register the project on GSASgate - the online certification management portal of GSAS Trust and pay the associated fees for certification. For information on fees, please refer to www.gord.qa.

Registration of a project is undertaken by an authorized GSAS Construction Management Service Provider (GSAS-CM SP). GSAS-CM SP is required to have at least one GSAS Construction Management Certified Green Professional (GSAS-CM CGP) with a valid license to manage the certification requirements.

7.2 SUBMISSION

The required documents and evidences should be prepared and submitted via the assigned GSAS-CM CGP following the guidelines and requirements for each criterion outlined in this manual. Projects need to demonstrate a successful submission of documents and supporting evidences in order to prove compliance with GSAS-CM requirements during the assessment period for each construction stage. Below is a guidance for the accepted submission as a minimum:

a. Narrative

As described in the Submittals section of each criterion, a narrative describes how each of the methods and measures is implemented on-site and should guide the GSAS Trust certifier through the submitted documentation. Therefore, the narrative should:

- Explain the implementation of each method and measure in the GSAS-CM Guidelines Manual.
- Provide clear reference to evidences (file name, section, page, highlight, etc.).

b. Evidences of Methods and Measures Implementation

- Shoot photos and videos showing they were taken on the construction site, as applicable.
- Drawings should have legends and be approved by Project Management/Construction Management (PMCM) or client representative.
- Tests results should be signed and stamped by the third-party laboratory and approved by PMCM or client representative.
- Relevant data should be highlighted in the data sheets.
- Submitted permits should be valid, please check they are not expired.
- Documents approved by PMCM if applicable, for example:
 - Materials approval requests (MARs).
 - Health & safety reports.
 - Environmental inspection reports.
 - Progress schedule.
- Calculators' supporting documents. All data entered in the calculator must be justified. Evidence documents to prove data and auxiliary calculations must be provided.
- Delivery notes (for example: Waste Transfer Notes) must be signed by both parties. The note should contain the following minimum information:
 - Project name,
 - Type of waste or material disposed from site.
 - Date of the transfer or disposal of waste.
 - Quantity of the material/waste in volume or weight.
- Invoices and monthly logs should contain the following minimum information:
 - Name of the project.
 - Name of supplier or subcontractor who appointed to transfer the waste from site.
 - Date of the invoice.

- Quantity of the waste transported or disposed from site.
- If the cost is not required, delete this reference.
- Signed and stamped by the issuing party.
- Evidence of training documentation should include presentation slides and attendance sheets including the name of the project, subject and date of the training, and the number of attendees.

7.3 ASSESSMENT

To fulfill the requirements of GSAS-CM certification, the following must be complied with:

1. Development and Submission of GSAS-CMP

GSAS-CMP shall be first developed and submitted by the contractor highlighting the targeted GSAS-CM categories and criteria, targeted final rating of GSAS-CM, and the management resources and processes required to meet the target. For a general outline on the plan, refer to the contents provided in “GSAS-CMP Guidelines & Assessment” section. An authorized GSAS-CM Service Provider is required to facilitate the signing off and delivery of the required GSAS-CMP.

Submission of the contractor’s GSAS-CMP is a prerequisite for obtaining the GSAS-CM certificate. The final score for conforming to the requirements of this part will be granted based on the adequacy of the submittals in accordance with the stipulated requirements of GSAS-CM Assessment and Guidelines Manuals. Failure to conform to this requirement may lead to GSAS certification being denied. Refer to section 9.0 “GSAS Construction Management Plan (GSAS-CMP)” for more details on these compliance requirements.

2. Submission for Assessment of Targeted GSAS-CM Criteria

The Contractor shall select the targeted criteria to achieve the desired GSAS-CM class rating and will implement the methods and measures outlined under each criterion in the guidelines.

The submissions for assessment of GSAS-CM criteria, including documentation of evidences for evaluating the sustainability impacts of the construction processes and practices of the contractor shall be provided as stipulated under the assessment section of each criterion.

GSAS Trust auditors will conduct the audits for the assessment of GSAS-CM criteria. During audits, auditors will also cross-check the implementation of the requirements of GSAS-CMP. Refer to SECTION II of this document: GSAS-CM Assessment, and GSAS-CM Guidelines Manual for more details of the compliance requirements.

The audits by GSAS Trust team for GSAS-CM certification are undertaken at each of the three construction stages (enabling / foundation stage; superstructure stage; and, finishing stage). The audits are comprised of two parts:

Part 1: Desk Review

The desk review of the submitted documents, required under GSAS-CM Assessment Manual, for completeness and compliance with the requirements. The submitted evidences must include the relevant data until the cut-off date of the construction stage, which are determined in the GSAS-CMP.

Part 2: Site Audit

Site audit is conducted to verify the implementation of the requirements under each criterion and their degree of implementation.

7.4 AUDIT ADVISORY NOTICES (AAN's)

After successful review of the submitted documents and conducting the site audit(s) for the construction stage under evaluation, GSAS Trust issues an interim AAN indicating the evaluation scores for each criterion targeted and assessed under the designated construction stage.

The cut-off date of each construction stage is determined in GSAS-CMP and accepted by GSAS Trust. The cut-off date of Stage 3 represents the project closing when the contractor requests the client for inspection of the substantially completed works.

The Applicants may submit an appeal upon issuance of AAN#3 on any individual criterion should they disagree with and not accept the decision made by GSAS Trust. The appeal process is only available at the end of Stage 3, no interim appeals are allowed for during stages 1 and 2. Further details can be found in the GORD website at www.gord.qa.

7.5 KEY TASKS TIMELINE

The timeline below (Figure 3) serves as brief guidance for the key tasks related to GSAS-CM certification activities that need to be performed by the project team at a given time within the project life for a smooth process and successful GSAS-CM certification.

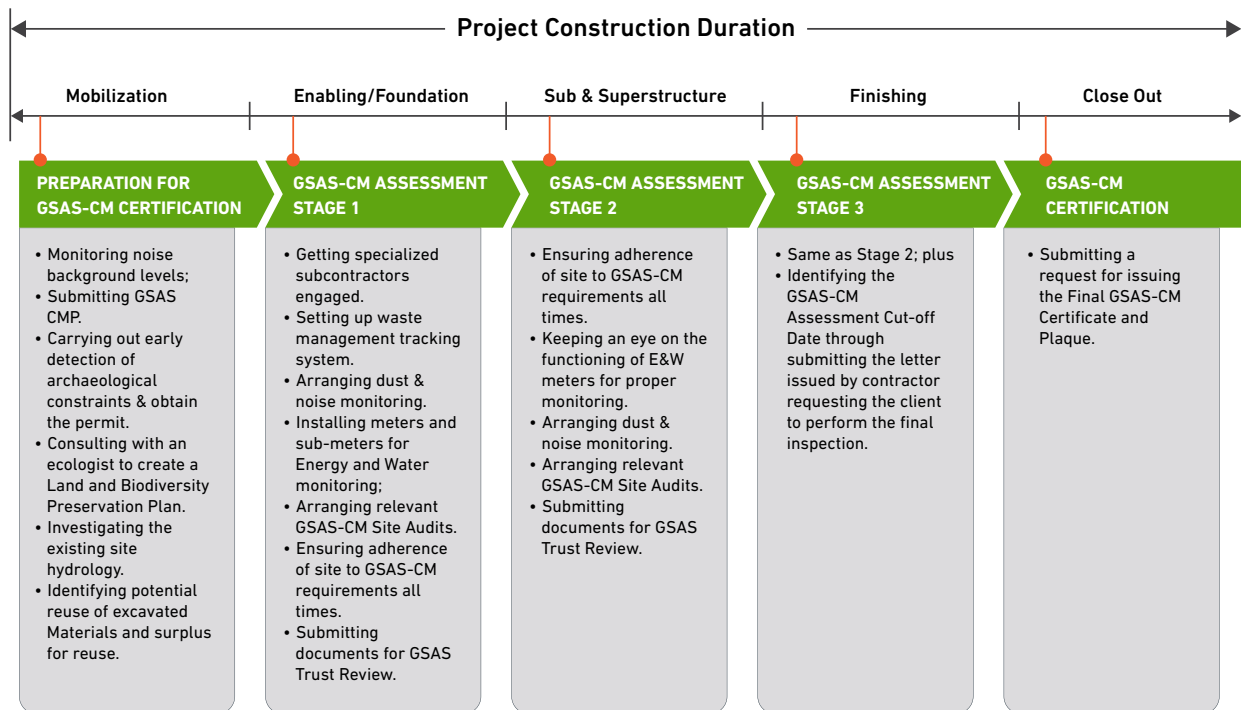


Figure 3: GSAS-CM Key Tasks Timeline

7.6 ISSUANCE OF THE CERTIFICATE

A Project that successfully complies with GSAS Construction Management assessments and complete the certification requirements will be awarded with the following:

- GSAS-CM Certificate.
- Plaque of Recognition.

See sample GSAS-CM Certificate and Plaque of Recognition in Figures (4) and (5).



Figure 4: GSAS-CM Certificate



Figure 5: GSAS-CM Plaque of Recognition

8.0 ROLES & RESPONSIBILITIES

GSAS Construction Management certification requires participation from various organizations and individuals including the project CGP and GSAS Trust. For a full outline of the roles and responsibilities, refer to the GSAS Technical Guide.

9.0 GSASGATE™

GSASgate™ is the online portal of GSAS for managing the project submission, assessment and certification processes for projects seeking GSAS accreditations. GSASgate™ is an integrated platform for the participation of all stakeholders involved in the GSAS certification process, including building owners/users, developers, facility managers/operators, GSAS Service Providers, contractors, consulting firms, government entities and GSAS Trust. GSASgate User manual is available for download from the GORD website at www.gord.qa.

10.0 GSAS TOOLS

10.1 SCORING SHEET

The GSAS Scoring Sheet is a useful sensitivity analysis tool to enable projects to compute the overall anticipated project score and certification rating under multiple scenarios. The tool provides the user with the opportunity to target, adjust and amend the level of each individual criterion to predict the final rating.

10.2 CALCULATORS

GSAS calculators are unique and user-friendly computational tools developed to perform the necessary calculations for the award of the criterion level.

The distinctive benefits and features of GSAS calculators include:

- Enables user input values through a simple interface.
- Performs complex algorithms, equations and calculations seamlessly.
- Avoids the need for the use of other complex software packages.

10.3 GSAS ENERGIA SUITE™

GSAS Energia Suite™ calculates the building's energy use based on CEN-ISO calculation method. GSAS Energia Suite™ translates the calculated energy and emission into effective Energy Performance Coefficient (EPC) values in relation to applicable GSAS benchmarks.

10.4 GSAS WATER SUITE™

GSAS Water Suite™ calculates the building's water consumption. GSAS Water Suite™ translates the calculated water consumption into effective Water Performance Coefficient (WPC) values in relation to applicable GSAS benchmarks.

10.5 PRESCRIPTIVE CRITERIA CHECKLISTS

Checklists are used to determine the criterion level of the prescriptive criteria based on the degree of compliance with relevant methods and measures outlined in GSAS-CM Guidelines Manual.

The checklists comprise of the methods and measures grouped by sections. Within each section, each method and measure is given a weight taking into consideration the significance of the sustainability impacts. For each listed method and measure, there is a degree of implementation: none, low, moderate, high or not applicable, determined by GSAS Trust and may vary based on the nature of the project.

The criterion checklist establishes the degree of compliance for each section as a percentage. The section is considered compliant if the degree of compliance with the requirements is 80% or higher.

The checklists provide recommended submittals lists of documents that prove the implementation of each one of the methods and measures. The Project may submit other documents, not included in the submittals list, as evidences of implementation; GSAS Trust will analyze such evidences and decide whether they are acceptable or not.

11.0 RESOURCE CENTER

The Resource Center is a web page in the GORD website at www.gord.qa that contains useful GSAS resource materials and information accessible to the public.

ASSESSMENT

CRITERIA SUMMARY

The table below summarizes the categories, criteria and the associated weights for GSAS-CM certification:

NO.	CATEGORY / CRITERION	LEVELS		WEIGHTS	INCENTIVE WEIGHTS
		Min	Max		
[UC]	URBAN CONSIDERATIONS				
UC.1	Traffic Management	0	3	3.00%	-
UC.2	Drain & Stormwater Contamination	0	3	3.00%	-
UC.3	Waterbody Contamination	0	3	2.00%	-
Total				8.00%	
[S]	SITE				
S.1	Land Preservation	0	3	3.00%	-
S.2	Biodiversity Preservation	0	3	2.00%	-
S.3	Erosion & Sediment Control	0	3	2.00%	-
S.4	Earthworks Control	0	3	3.00%	-
S.5	Dewatering Control	0	3	5.00%	-
Total				15.00%	
[E]	ENERGY				
E.1	Energy Use – Temporary Buildings	0	3	9.00%	1.50%
E.2	Energy Use – Plant & Equipment	0	3	3.00%	1.50%
Total				12.00%	3.00%
[W]	WATER				
W.1	Domestic Water Use	0	3	6.00%	1.00%
W.2	Non-Domestic Water Use	0	3	4.00%	1.00%
Total				10.00%	2.00%

NO.	CATEGORY / CRITERION	LEVELS		WEIGHTS	INCENTIVE WEIGHTS
		Min	Max		
[M]	MATERIALS				
M.1	Materials Diversion from Landfill	0	3	3.00%	-
M.2	Materials Eco-Labeling	0	3	4.00%	2.00%
M.3	Cut & Fill Optimization	0	3	3.00%	-
Total				10.00%	2.00%
[OE]	OUTDOOR ENVIRONMENT				
OE.1	Dust Control	0	3	8.00%	2.00%
OE.2	Noise & Vibration Control	0	3	6.00%	-
OE.3	Light Pollution & Visual Impact Control	0	3	3.00%	-
OE.4	Odor & VOC Emissions Control	0	3	2.00%	-
Total				19.00%	2.00%
[SD]	SOCIO-CULTURAL DIMENSION				
SD.1	Protection of Archaeological Remains	0	3	2.00%	-
SD.2	Socio-Cultural Interaction	0	3	3.00%	-
Total				5.00%	
[MO]	MANAGEMENT & OPERATIONS				
MO.1	Waste Management	0	3	7.00%	-
MO.2	Welfare Facilities	0	3	5.00%	-
MO.3	Construction Health & Safety	0	3	6.00%	3.00%
MO.4	Workers Accommodation	0	3	3.00%	4.00%
Total				21.00%	7.00%

STRUCTURE OF ASSESSMENT

The table below summarizes the elements of assessment for each criterion in GSAS-CM certification:

PURPOSE	Outlines the objective of the criterion.
ASSESSMENT PRINCIPLES	Summarizes the overall principles 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 the project is required to submit to demonstrate compliance.

1.0 [UC] URBAN CONSIDERATIONS

The Urban Considerations category considers aspects related to traffic management, drain, stormwater and waterbody contamination.

IMPACTS

Environmental impacts resulting from unsustainable urban practices include:

- Land Use & Contamination,
- Water Pollution,
- Air Pollution,
- Human Health & Comfort.

MITIGATE IMPACT

Measures that could mitigate environmental impact include:

- Controlling the impacts of traffic on-site and neighboring sites,
- Preventing any risks or pollution to drain, stormwater and waterbodies,
- Maintaining the water quality of existing waterbodies.

CRITERIA SUMMARY

No.	Criterion	Level		Weight
		Min	Max	
UC.1	Traffic Management	0	3	3.00%
UC.2	Drain & Stormwater Contamination	0	3	3.00%
UC.3	Waterbody Contamination	0	3	2.00%
Total				8.00%

1.1 [UC.1] TRAFFIC MANAGEMENT

1.1.1 PURPOSE

To manage on-site and off-site traffic and minimize disruption of the local transportation network and pattern.

1.1.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented for managing:

- On-site traffic and transportation.
- Off-site public and construction traffic in the vicinity of the construction site.

The Project will prepare traffic management **reports** to establish the **criterion level**.

1.1.3 ASSESSMENT

1.1.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of [UC.1] Traffic Management Checklist - Part (A) Off-Site.
- Full compliance is achieved when the report demonstrates implementation of [UC.1] Traffic Management Checklist - Part (A) Off-Site AND Part (B) On-Site.
- Assess the nearby road network potentially affected by the project in liaison with relevant local authorities, stakeholders and neighboring communities.
- Assess the on-site logistics needs of the Project to secure safety of workers and visitors and minimize movement of plant and vehicles.
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of traffic associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

1.1.3.2 Report

Prepare a Traffic Management Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of the traffic in the vicinity of the site, challenges encountered by the Project, and the main strategies adopted to manage traffic, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Layout drawings of the existing road network and of road closures, diversions and alternative accesses as applicable.
- Logistics layout drawings showing signage and haul roads.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [UC.1] Traffic Management Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [UC.1] Traffic Management Checklist.

1.1.4 CRITERION LEVELS

Levels	Compliance with [UC.1] Traffic Management Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates partial compliance.
3	Report demonstrates full compliance.

1.1.5 SUBMITTALS

- Submit the Traffic Management Report, which includes the narrative summarizing the status of traffic management relevant to the construction stage where applicable.
- Documents/evidences proving the implementation of each one of the methods and measures as outlined in [UC.1] Traffic Management Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [UC.1] Traffic Management Checklist.

1.2 [UC.2] DRAIN & STORMWATER CONTAMINATION

1.2.1 PURPOSE

To prevent contamination of drain and stormwater due to construction activities.

1.2.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to prevent contamination of:

- Drainage systems.
- Stormwater systems.

The Project will prepare drain and stormwater contamination **reports** to establish the **criteria level**.

1.2.3 ASSESSMENT

1.2.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of [UC.2] Drain & Stormwater Contamination Checklist - Part (A) Stormwater Contamination Control OR Part (B) Sewer Contamination Control.
- Full compliance is achieved when the report demonstrates implementation of [UC.2] Drain & Stormwater Contamination Checklist - Part (A) Stormwater Contamination Control AND Part (B) Sewer Contamination Control.
- Assess the possibilities of connection to nearby drain and stormwater systems in coordination with relevant local authorities.
- Assess potential impacts of construction activities and site logistics relative to the existing drain and stormwater systems.
- Implement the methods and measures outlined in the GSAS-CM Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of drain and stormwater contamination associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

1.2.3.2 Report

Prepare a Drain & Stormwater Contamination Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of the drain and stormwater systems in the vicinity of the site, challenges encountered by the Project, and the main strategies adopted to prevent contamination of these systems, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Layout of the existing drain and stormwater systems.
- Tests results of discharged water to the existing drain and stormwater systems if applicable.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [UC.2] Drain & Stormwater Contamination Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [UC.2] Drain & Stormwater Contamination Checklist.

1.2.4 CRITERION LEVELS

Levels	Compliance with [UC.2] Drain & Stormwater Contamination Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates partial compliance.
3	Report demonstrates full compliance.

1.2.5 SUBMITTALS

- Submit the Drain & Stormwater Contamination Report, which includes the narrative summarizing the status of drain and stormwater contamination relevant to the construction stage where applicable.
- Documents/evidences proving the implementation of each one of the methods and measures as outlined in [UC.2] Drain & Stormwater Contamination Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [UC.2] Drain & Stormwater Contamination Checklist.

1.3 [UC.3] WATERBODY CONTAMINATION

1.3.1 PURPOSE

To maintain the water quality of existing waterbodies from the impact of construction activities.

1.3.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to maintain the water quality of existing waterbodies on or in the vicinity of the site from the potential impacts of construction activities.

The Project will prepare waterbody contamination **reports** to establish the **criterion level**.

1.3.3 ASSESSMENT

1.3.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of [UC.3] Waterbody Contamination Checklist - Part (A) General Controls.
- Full compliance is achieved when the report demonstrates implementation of [UC.3] Waterbody Contamination Checklist – Part (A) General Controls AND Part (B) Silt Curtains.
- Level of 1 is achieved when the report demonstrates the non-existence of waterbodies.
- Assess the hydrology of the site and surroundings identifying water bodies potentially impacted by the construction activities.
- Assess the potential impacts of the construction activities and the site logistics to the existing water bodies.
- Assess the methods and measures to be implemented to preserve the water quality, including testing of discharged water from the site into the water bodies if applicable.
- Implement on-site the methods and measures outlined in the GSAS-CM Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of waterbody contamination associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

1.3.3.2 Report

Prepare a Waterbody Contamination Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of waterbodies on or in the vicinity of the site, challenges encountered by the Project, and the main strategies adopted to prevent contamination of waterbodies, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Hydrology study of the construction site.
- Physical and chemical test results of discharged water to the waterbody if applicable.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [UC.3] Waterbody Contamination Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [UC.3] Waterbody Contamination Checklist.

1.3.4 CRITERION LEVELS

Levels	Compliance with [UC.3] Waterbody Contamination Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates non-existence of waterbodies.
2	Report demonstrates partial compliance.
3	Report demonstrates full compliance.

1.3.5 SUBMITTALS

- Submit the Waterbody Contamination Report, which includes the narrative summarizing the status of waterbody contamination relevant to the construction stage where applicable.
- Documents/evidences proving the implementation of each one of the methods and measures as outlined in [UC.3] Waterbody Contamination Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [UC.3] Waterbody Contamination Checklist.

2.0 [S] SITE

The Site category considers aspects related to land preservation, biodiversity preservation, erosion and sediment control, earthworks control and dewatering control.

IMPACTS

Environmental impacts resulting from unsustainable site practices include:

- Land Contamination and Ecological Value Deterioration;
- Biodiversity Deterioration,
- Water Pollution,
- Air Pollution,

MITIGATE IMPACT

Factors that could mitigate environmental impact include:

- Preserving or enhancing land quality,
- Preserving biodiversity of the site,
- Controlling erosion and prevent off-site sedimentation,
- Minimizing negative impacts of earthworks activities,
- Minimizing negative impacts of dewatering activities.

CRITERIA IN THIS CATEGORY

No.	Criterion	Level		Weight
		Min	Max	
S.1	Land Preservation	0	3	3.00%
S.2	Biodiversity Preservation	0	3	2.00%
S.3	Erosion & Sediment Control	0	3	2.00%
S.4	Earthworks Control	0	3	3.00%
S.5	Dewatering Control	0	3	5.00%
Total				15.00%

2.1 [S.1] LAND PRESERVATION

2.1.1 PURPOSE

To preserve or enhance the land through remediation, conservation, and/or restoration.

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, of 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 together 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 promote 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 methods and measures on the conservation and management of ecologically valuable lands to prevent an adverse impact on biodiversity during the development of the project site.
- Site Restoration - describes the methods 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.

2.1.3.1 General

- In some instances, the criterion level can be directly inherited from the GSAS-D&B [S.1] Land Preservation criterion. Otherwise, the Project needs to comply with the GSAS-CM [S.1] Land Preservation criterion requirements.
- Engage a specialist in assessing the site by evaluating the ecological value of the land soil quality and the areas of 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 methods and measures for remediating the sources of contamination.
- Establish from the testing the pre-development ecological value of the land.
- Prepare the post-development remediations or enhancement strategies for the land.
- At each construction stage, input the data into [S.1] Land Preservation Calculator to determine the improvement factor of the ecological value of the land.
- At each construction stage, prepare all applicable documentation to substantiate the values inputted in the calculator.
- Obtain relevant permits.

2.1.3.2 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, of 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 land with and without improved classifications relative to the pre-development classifications.

B. Calculations

- Weighting 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, land of no ecological value, land with low ecological value, land with moderate ecological value, and land 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 estimated improvement factors for each land classifications. Land Preservation Indicator (X) determines the criterion level.

2.1.4 CRITERION LEVELS

Case A – Level is NOT Inherited form GSAS-D&B

Levels	Compliance with [S.1] Land Preservation Requirements
0	Report does not demonstrate compliance compliant or $X < 0.25$
1	$0.25 \leq X < 0.50$
2	$0.50 \leq X < 0.75$
3	$X \geq 0.75$

Case B – Level is Inherited form GSAS-D&B

Where a Project pursuing GSAS-D&B certification [S.1] Land Preservation, the Stages 1 and 2 levels can be inherited according to the awarded Provisional Certificate (Letter of Conformance – LOC) or the awarded Final Certificate (Conformance to Design Audit - CDA). Stage 3 level will be inherited according to the final awarded GSAS-D&B [S.1] Land Preservation criterion level.

Note:

- GSAS-CM [S.1] Land Preservation final level will correspond to the GSAS-D&B [S.1] Land Preservation final certificate level.
- The level inherited for GSAS-CM [S.1] Land Preservation will be 0 if the level achieved in GSAS-D&B [S.1] Land Preservation is -1.

- [S.1] Land Preservation is assessed over each of the construction stages and the final criterion level will correspond to the Stage 3 criterion level.

2.1.5 SUBMITTALS

Case A – Level is NOT Inherited from GSAS-D&B

(I) Construction Stage 1

Submit the Land Preservation Report demonstrating site assessment and strategies to conserve, restore, or enhance the site, including:

- A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
- Relevant Landscape drawings and specifications.
- Applicable permits from concerned authorities.
- Assessment Report.
- Geological and Environmental Testing in accordance with the applicable standards, including the report of the results and analyses from an accredited laboratory.
- [S.1] Land Preservation Calculator.

(II) Construction Stage 2

- A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
- Updated relevant Landscape drawings and specifications.
- Updated assessment report including evidences of the implementation of the methods and measures outlined in the assessment report, for example environmental inspection reports.
- Updated [S.1] Land Preservation Calculator.

(III) Construction Stage 3

- A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
- Relevant as-built drawings.
- Updated assessment report including evidences of the implementation of the methods and measures outlined in the assessment report, for example environmental inspection reports.
- Post-development environmental testing.
- Updated [S.1] Land Preservation Calculator.

Case B – Level is Inherited from GSAS-D&B

Submit evidence of GSAS-D&B [S.1] Land Preservation awarded level. Where the final level has not yet been awarded, submit the letter of conformance (LOC).

2.2 [S.2] BIODIVERSITY PRESERVATION

2.2.1 PURPOSE

To preserve the natural biodiversity of the site.

2.2.2 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**.

2.2.3 ASSESSMENT

The criterion requires assessing the existence of plants and endangered animals and 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. In development with a large site, the location may impact the habitats of endangered animals, migration or living patterns and 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 and restoration 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 evidence 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, preservation, and protection of plant species and endangered animals including their natural habitats during and after construction. The plan includes identifying the types and number of plants and endangered animals and the potential of the development 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 development to the interaction of ecosystems within the site and surrounding areas.
- The methods and measures for the preservation and protection of plants and endangered animals, including their habitats within the site and adjacent areas.

2.2.3.1 General

- Partial compliance is achieved when the report demonstrates the preservation of either the plants or the habitats of endangered animals.
- Full compliance is achieved when the report demonstrates implementation of [S.2] Biodiversity Preservation Checklist.
- Level of 1 is achieved when the report demonstrates there are no endangered habitats.
- Where the Project is seeking GSAS-D&B certification, the criterion level can be directly inherited from the GSAS-D&B [S.3] Biodiversity Preservation criterion. Otherwise, the Project needs to comply with the GSAS-CM [S.2] Biodiversity Preservation criterion requirements.
- Ensure that the biodiversity protection plan includes the following: establishing an inventory of the plants and endangered animals, assessing the potential impacts of the construction activities to the ecosystem, and describing the conservation or restoration methods and measures of the biodiversity of the site during the construction stage.
- Engage a specialist in evaluating the site for the existence of plants and habitats of endangered animals.
- Determine the potential for the development to damage the ecosystem's interaction with the site and the surrounding areas.
- Determine the methods and measures to 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.

2.2.4 CRITERION LEVELS

Case A – Level is NOT Inherited form GSAS-D&B

Levels	Compliance with [S.2] Biodiversity Preservation Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates no endangered habitats.
2	Report demonstrates partial compliance.
3	Report demonstrates full compliance.

Case B - Level is Inherited form GSAS-D&B

Where a Project is pursuing GSAS-D&B certification [S.3] Biodiversity Preservation, the Stage 1 and 2 levels can be inherited according to the awarded Provisional Certificate (Letter of Conformance – LOC) or the awarded Final Certificate (Conformance to Design Audit - CDA). Stage 3 level will be inherited according to the final awarded GSAS-D&B [S.3] Biodiversity Preservation criterion level.

Note:

- GSAS-CM [S.2] Biodiversity Preservation final level will correspond to the GSAS-D&B [S.3] Biodiversity Preservation final certificate level.
- The level inherited for GSAS-CM [S.2] Biodiversity Preservation will be 0 if the level achieved in GSAS-D&B [S.3] Biodiversity Preservation is -1.
- [S.2] Biodiversity Preservation is assessed over each of the construction stages and the final criterion level will correspond to the Stage 3 criterion level.

2.2.5 SUBMITTALS

Case A – Level is NOT Inherited form GSAS-D&B

(I) Construction Stage 1

Submit the Biodiversity Preservation Report demonstrating the assessment of the existing biodiversity on-site and strategies to protect and preserve them, including:

- 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.
- Inspection Report.
- Biodiversity Preservation Plan.

(II) Construction Stage 2

- A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
- Updated Biodiversity Preservation Report including evidences of the implementation of the measures and strategies, for example environmental inspection reports.

(III) Construction Stage 3

- A narrative explaining the approach undertaken for the criterion assessment and highlighting the basis of any assumptions.
- Relevant as-built drawings.
- Updated Biodiversity Preservation Report including evidences of the implementation of the measures and strategies, for example environmental inspection reports.

Case B - Level is Inherited form GSAS-D&B

Submit evidence of GSAS-D&B [S.3] Biodiversity Preservation awarded level. Where the final level has not yet been awarded, submit the letter of conformance (LOC).

2.3 [S.3] EROSION & SEDIMENT CONTROL

2.3.1 PURPOSE

To minimize the risk of soil erosion and sedimentation due to construction activities.

2.3.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented for:

- Erosion control,
- Sedimentation control.

The Project will prepare erosion and sedimentation control **reports** to establish the **critterion level**.

2.3.3 ASSESSMENT

2.3.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of [S.3] Erosion & Sediment Control Checklist - Part (A) Erosion Control OR Part (B) Sedimentation Control.
- Full compliance is achieved when the report demonstrates implementation of [S.3] Erosion & Sediment Control Checklist - Part (A) Erosion Control AND Part (B) Sedimentation Control.
- Assess the pre-construction condition of the site, including tests and surveys.
- Assess the construction activities and the site logistics to identify potential erosion impacts on the site and the surroundings.
- Implement on-site the methods and measures outlined in the GSAS-CM Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of erosion and sediment associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

2.3.3.2 Report

Prepare an Erosion & Sediment Control Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of the topography and soil quality of the site, challenges encountered by the Project, and the main strategies adopted to manage erosion and sediment control, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Summary of the pre-construction conditions of the site in relation to this criterion.
- Test results and survey reports conducted for the assessment of the site conditions.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [S.3] Erosion & Sediment Control Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [S.3] Erosion & Sediment Control Checklist.

2.3.4 CRITERION LEVELS

Levels	Compliance with [S.3] Erosion & Sediment Control Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates partial compliance.
3	Report demonstrates full compliance.

2.3.5 SUBMITTALS

- Submit the Erosion and Sedimentation Control Report, which includes the narrative summarizing the status of erosion and sedimentation relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [S.3] Erosion & Sediment Control Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [S.3] Erosion & Sediment Control Checklist.

2.4 [S.4] EARTHWORKS CONTROL

2.4.1 PURPOSE

To minimize the impact of earthworks activities on the construction site.

2.4.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented associated with land grading, drilling and reconfiguration of the topography of the site.

The Project will prepare earthworks control **reports** to establish the ***criterion level***.

2.4.3 ASSESSMENT

2.4.3.1 General

- Full compliance is achieved when the report demonstrates implementation of [S.4] Earthworks Control Checklist.
- Assess the potential impacts of the earthworks and stockpiles on air, water and soil pollution.
- Implement the methods and measures outlined in the GSAS-CM Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of earthworks associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

2.4.3.2 Report

Prepare an Earthworks Control Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of the topography and soil quality of the site, challenges encountered by the Project, and the main strategies adopted to manage earthworks control, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Layout drawing of stockpiles and main earthworks on-site.

- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [S.4] Earthworks Control Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [S.4] Earthworks Control Checklist.

2.4.4 CRITERION LEVELS

Levels	Compliance with [S.4] Earthworks Control Requirements
0	Plan does not demonstrate compliance.
3	Plan demonstrates full compliance.

2.4.5 SUBMITTALS

- Submit the Earthworks Control Report, which includes the narrative summarizing the status of earthworks relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [S.4] Earthworks Control Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [S.4] Earthworks Control Checklist.

2.5 [S.5] DEWATERING CONTROL

2.5.1 PURPOSE

To minimize the impact of dewatering activities on the construction site.

2.5.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented for:

- Discharge of groundwater,
- Monitoring of discharged water quality.

The Project will prepare dewatering control **reports** to establish the **criterion level**.

2.5.3 ASSESSMENT

2.5.3.1 General

- Full compliance is achieved when the report demonstrates implementation of [S.5] Dewatering Control Checklist.
- Level of 1 is achieved when the report demonstrates the non-applicability of this criterion.
- Conduct a groundwater investigation to determine the depth of the water table, the expected amount of water to be encountered during the excavation and construction processes.
- Assess the project design requirements to determine if dewatering is needed.
- Identify the possible discharge points and engage the local authorities to obtain the related permits and treatment requirements.
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of dewatering associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

2.5.3.2 Report

Prepare a Dewatering Control Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of the hydrology of the site, challenges encountered by the Project, and the main strategies adopted to manage dewatering control, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Groundwater investigation report showing the existing conditions of underground water on-site.
- Tests results and treatment system of discharged water if applicable.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [S.5] Dewatering Control Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [S.5] Dewatering Control Checklist.

2.5.4 CRITERION LEVELS

Levels	Compliance with [S.5] Dewatering Control Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates non-applicability.
3	Report demonstrates full compliance.

Note:

- When dewatering is no longer applicable in stages 2 and 3, the final level would be the score awarded in stage 1; however, if dewatering was no longer applicable in stage 3, the final level shall be determined based on the average of each of the levels awarded in stages 1 and 2 adjusted to the nearest applicable criterion level.

2.5.5 SUBMITTALS

- Submit the Dewatering Control Report, which includes the narrative summarizing the status of dewatering control relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [S.5] Dewatering Control Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [S.5] Dewatering Control Checklist.

3.0 [E] ENERGY

The Energy category considers aspects related to energy management and the contractors use of energy during construction.

IMPACTS

Negative impacts resulting from unsustainable energy use include:

- Climate Change,
- Fossil Fuel Depletion,
- Air Pollution.

MITIGATE IMPACT

Measures that could mitigate environmental impacts due to unsustainable energy use include:

- Selecting efficient materials and systems for temporary buildings,
- Selecting energy efficient construction equipment and machinery,
- Using renewable and/or low-carbon energy sources.

CRITERIA IN THIS CATEGORY

No.	Criterion	Level		Weight	Incentive Weight
		Min	Max		
E.1	Energy Use – Temporary Buildings	0	3	9.00%	1.50%
E.2	Energy Use – Plant & Equipment	0	3	3.00%	1.50%
Total				12.00%	3.00%

3.1 [E.1] ENERGY USE - TEMPORARY BUILDINGS

3.1.1 PURPOSE

To minimize the energy consumption of temporary buildings.

3.1.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to manage and minimize energy use associated with temporary buildings on-site.

The Project will complete **GSAS Energia Suite™** to establish the **criterion level**.

3.1.3 ASSESSMENT

3.1.3.1 General

The criterion requires assessing the energy use of temporary buildings by calculating the Energy Performance Coefficient (EPC) value using GSAS Energia Suite™.

The EPC represents the efficiency of temporary buildings including system installations and is calculated using the equation below:

$$EPC = \frac{E_{(use_Norm)}}{E_{(use_ref)}}$$

Where,

$E_{use-Norm}$ is the normalized energy use in kWh/m²

$E_{use-ref}$ is the reference value for energy use in kWh/m²

“ $E_{use-Norm}$ ” is derived from the calculation of the energy use in kWh for the temporary buildings on-site based on the as-built specifications.

The “ $E_{use-Norm}$ ” is calculated based on the following building/systems features:

- Occupancy and operational profile.
- Internal and external heat gains.
- HVAC systems.
- Lighting systems.
- Auxiliaries and equipment.
- Domestic hot water systems.

"E_{use_ref}" is the benchmark for the energy use in kWh. This is calculated based on GSAS reference values for primary and auxiliary building systems and materials and taking into consideration the local weather data.

Refer to GSAS energy framework described in the GSAS-D&B Assessment Manual for further information regarding the energy benchmarking and calculation methodology.

- Assess the site surroundings for available connections to the existing electricity grid and engage the local authorities for required permits.
- Assess the logistics requirements of the project and devise appropriate electrical installation and selection of electrical devices for the temporary buildings to ensure minimization of the energy use.
- Prepare an inventory list of the electrical equipment used on site: HVAC, lighting, pumps, fans, domestic hot water and other equipment such as computers, monitors, printers, servers, etc. Construction sites are very dynamic, temporary buildings and electrical equipment are installed and removed depending on the operational and logistics needs; therefore, it is advisable to keep the inventory list updated on a monthly basis to enable a fair estimation of the operating hours of the electrical devices.
- Obtain from the name plates and manufacturers data sheets the data required to be inputted in the GSAS Energia Suite™.
- Determine the temporary buildings envelope physical characteristics and materials specifications.
- Determine the solar transmittance and shading reduction factors, if applicable.
- Input the data into GSAS Energia Suite™ to determine the Energy Performance Coefficient (EPC) for E.1 Energy Management - Temporary Buildings.
- Prepare all applicable documentation to support the input values entered in the GSAS Energia Suite™.
- If the incentive score is targeted, install meters to measure the electricity consumption of the temporary buildings and prepare records of the consumption data for submission.

3.1.3.2 Calculator

A. General

GSAS Energia Suite™ translates the calculated energies and emissions into effective Energy Performance Coefficient or EPC values in relation to applicable GSAS benchmarks and then generates the corresponding criterion level.

The characteristics of GSAS Energia Suite™ include the following distinctive benefits and features:

- Enables user input values through a simple interface,
- Performs complex algorithms, equations and calculations seamlessly,
- Avoids the need for the use of other complex software packages.

GSAS Energia Suite™ for Construction Management is structured to assess and determine the performance of energy consumption of different building types present on a construction site.

General Information

- Input the general project information: Country, city, GSAS Project ID and name etc.
- Input the occupancy schedule and operating profile.

Envelope Information Inputs

- Input the internal total gross floor area of the air-conditioned spaces, height and volume,
- Input exposed envelope area for each orientation of the building façade,
- Input the U-value for opaque walls, glazing and doors for each wall orientation,
- Input the solar reduction factors, solar transmittance and frame fraction of the glazing.

Cooling Information Inputs

- Input the quantity, nameplate power (kW) and the cooling capacity of the cooling system at 46 °C ambient conditions.

Lighting Information Inputs

- Input the lighting fixture type, lamps per fixtures, watts per lamp and operating hours

Auxiliaries Information Inputs

- Input the pumps and fans quantity, capacity, power, efficiency, load factor and operating hours.
- Input the quantity of energy consuming equipment: computers, laptops, televisions, servers, refrigerators etc. with the name-plate power input, load factor and operating hours.

Domestic Hot Water System

- Input the quantity, capacity, power, load factor, efficiency and operating hours for domestic hot water systems.

B. Calculations

GSAS Energia Suite™ automatically calculates the EPC value of the energy use and generates the corresponding Energy Use Performance for each of the applicable building types.

3.1.4 CRITERION LEVELS

Levels	Compliance with [E.1] Energy Use – Temporary Buildings Requirements
0	$EPC > 0.95$
1	$0.75 < EPC \leq 0.95$
2	$0.65 < EPC \leq 0.75$
3	$EPC \leq 0.65$

Incentive Weights:

An incentive weight of 1.50% is awarded for monitoring the electricity consumption of temporary buildings.

3.1.5 SUBMITTALS

Submit GSAS Energia Suite™ together with the documents and auxiliary calculations supporting all the input values, including:

- Narrative linking the input data with the supporting documents.
- GSAS Energia Suite™ input Excel spreadsheet.
- As-built drawings for all temporary buildings on-site, including offices, workers accommodation, canteen buildings, welfare facilities, workshops, warehouses and other facilities.
- Auxiliary calculations justifying the input values as applicable.
- Electrical equipment data sheets or name-plate photographs.
- Photographs of electrical equipment.
- If the incentive score is targeted, submit a records of the overall electricity consumption of the temporary buildings, including a summary with the monthly readings of the generators, photos of the meters installed on site and a single line diagram showing the generators, load and location of meters.

3.2 [E.2] ENERGY USE – PLANT & EQUIPMENT

3.2.1 PURPOSE

To minimize the energy consumption of plant and equipment during construction.

3.2.2 ASSESSMENT PRINCIPLES

The Project will assess the methods and measures implemented to manage and minimize the energy use of plant and equipment associated with construction activities including generators, mobile lighting, tower cranes, pumps, tools etc.

The Project will prepare an Energy Use - Plant & Equipment report to establish the criterion level.

3.2.3 ASSESSMENT

3.2.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of [E.2] Energy Use – Plant & Equipment Checklist with a minimum degree of 70% compliance.
- Substantial compliance is achieved when the report demonstrates implementation of [E.2] Energy Use – Plant & Equipment Checklist with a minimum degree of 80% compliance.
- Full compliance is achieved when the report demonstrates implementation of [E.2] Energy Use – Plant & Equipment Checklist with a minimum degree of 90% compliance.
- Assess the site surroundings for available connections to the existing electricity grid and engage the local authorities for required permits if applicable.
- Select appropriate power generation systems for use during construction in terms of environmental impact and fuel consumption.
- Implement on-site the methods and measures outlined in the GSAS-CM Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed energy needs for plant and equipment associated with the construction activities.
- Identify the major energy consuming plant, tools and equipment, to be considered for the criterion assessment and estimate the overall energy need.
- Determine the efficiencies of site construction plant and equipment including generators, tower cranes, pumps, fans, compressors and other main energy-consuming equipment.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.

- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.
- If the incentive score is targeted, monitor the overall electricity consumption of the plant and equipment fed by generators and prepare the records for submission.

3.2.3.2 Report

Prepare the Energy Use Plant & Equipment Report to demonstrate the implementation of the methods and measures identified by the Project during the construction stage, including:

- Narrative describing the project need for plant and equipment, challenges encountered by the Project, strategies adopted to manage energy use for plant and equipment; in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Nameplate rating data of the major energy consuming equipment on-site.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents proving implementation on-site, listed in [E.2] Energy Use – Plant & Equipment Checklist. If necessary, provide justification of non-applicability of any of the methods and measures outlined in the Guidelines Manual.
- Brief on targeted activities or challenges for the next construction stage.
- Records of the overall energy consumption of the construction site.
- Completed [E.2] Energy Use – Plant & Equipment Checklist.

3.2.4 CRITERION LEVELS

Levels	Compliance with [E.2] Energy Use – Plant & Equipment Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates partial compliance.
2	Report demonstrates substantial compliance.
3	Report demonstrates full compliance.

Incentive Weights:

An incentive weight of 1.50% is awarded for monitoring the electricity consumption of plant and equipment.

3.2.5 SUBMITTALS

- Submit the Energy Use – Plant & Equipment Report including all evidences supporting the implementation of methods and measures.
- Completed [E.2] Energy Use – Plant & Equipment Checklist.
- If the incentive score is targeted, submit records of the overall electricity consumption of plant and equipment, including a summary with the monthly readings of the generators, photos of the meters installed on site and a single line diagram showing the generators, load and location of meters.

4.0 [W] WATER

The Water category considers aspects related to water consumption and management for domestic and non-domestic applications.

IMPACTS

Impacts resulting from unsustainable water consumption include:

- Water depletion,
- Human Comfort & Health,
- Water pollution and contamination.

MITIGATE IMPACT

Measures that could mitigate environmental impacts and lower demand on water include:

- Implementing water conservation practices,
- Selecting efficient water-consuming fixtures,
- Creating a system for collection and reuse,
- Treating water on-site.

CRITERIA IN THIS CATEGORY

No.	Criterion	Level		Weight	Incentive Weight
		Min	Max		
W.1	Domestic Water Use	0	3	6.00%	1.00%
W.2	Non-Domestic Water Use	0	3	4.00%	1.00%
Total				10.00%	2.00%

4.1 [W.1] DOMESTIC WATER USE

4.1.1 PURPOSE

To minimize the domestic water consumption in temporary buildings.

4.1.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to manage and minimize domestic water consumption in temporary buildings including offices, warehouses, workshops and welfare facilities.

The Project will complete **GSAS Water Suite™** to establish the **criterion level**.

4.1.3 ASSESSMENT

4.1.3.1 General

The Criterion requires assessing the domestic water use of the site by calculating the Water Performance Coefficient (WPC) using GSAS Water Suite™.

GSAS Water Suite™ calculates two water performance coefficients: WPC calculated (WPC_{cal}) and WPC measured (WPC_{meas}).

The WPC_{cal} represents the domestic water use efficiency on-site.

$$WPC_{cal} = \frac{W_{cal}}{W_{ref}}$$

Where:

- W_{cal} is the water use of the manpower on-site based on the domestic fixtures installed.
- W_{ref} is benchmark for water use for the project. This is based on GSAS reference values for water consumption for building occupants, systems and fixtures.

The WPC_{meas} represents the domestic water efficiency based on the actual consumption on-site.

$$WPC_{meas} = \frac{W_{meas}}{W_{ref}}$$

Where:

- W_{meas} is the actual domestic water consumption on-site from metered data.
- W_{ref} is the benchmark for water use for the project. This is based on GSAS reference values for water consumption for building occupants, systems and fixtures.

Water Use (W_{cal} and W_{meas}) is the water use based on occupancy, operations profile and the building type and considers the water consumption linked to the inventory and specifications of plumbing fixtures and water consuming appliances.

- Assess the site surroundings for available connections to the existing water mains and engage the local authorities for required permits if applicable.
- Assess the logistics requirements of the project and devise appropriate plumbing installations and selection of water fixtures for offices and welfare facilities to ensure minimization of water consumption.
- Install a metering system to allow the measurement of the overall water consumption for domestic use.
- Prepare an inventory list of the water fixtures used on-site, including toilets, urinals, lavatories, etc. installed in the welfare facilities. To be accounted for domestic water consumption, such facilities should be within the construction site boundaries.
- Obtain the fixture flow rates from the manufacturers data sheets for input in the GSAS Water Suite™. If data sheets are not available, measure the water fixture flow rate on-site.
- Record of the monthly domestic water consumption.
- Obtain the monthly average manpower on-site from the relevant department.
- Prepare all applicable documentation to support the input values entered in the GSAS Water Suite™.
- If the incentive score is targeted, install meters to measure the domestic water consumption and prepare records of the consumption data for submission.

4.1.3.2 Calculator

A. General

Project must divide the welfare facilities using water fixtures for domestic purposes including:

- Workers accommodation if it is within or associated with the construction site boundary or, as agreed with GSAS Trust, forms part of GSAS-CM certification.

- Facilities, including kitchens, laundries and canteens. The washing facilities and toilets attached to the canteens generally used only during the lunch/dinner breaks are to be considered as within the facilities.
- Domestic sites. The remaining facilities using domestic water fixtures are considered under this category including, offices, workshops, toilets, rest areas and washing facilities available on-site to the construction workers.

B. Inputs

- Input the general project information: country, city, GSAS Project ID and name etc.
- Input the occupancy schedule and operating profile.
- Input the site area and built-up area of the project.
- Enter the composition of the welfare facilities using water fixtures (domestic sites, facilities and Workers accommodation).

Occupants – Domestic Site

The construction workers are also included in this sheet as occupants of one of the sections. While not generally occupying the offices on-site, they are consuming domestic water and as such they must be included in the calculations.

Occupants – Facilities

The “hours/day” entered in the “Occupants – Facilities” sheet plus the “hours/day” entered in the “Occupants – Domestic_Site” sheet, must equal the total hours/day the employees/construction workers are on-site.

Fixtures

Depending on the composition of the welfare facilities on-site, three different tables are generated in the Fixtures sheet, one for Domestic site section, one for facilities and one for Workers accommodation. Each caters for one, two or three groups of facilities.

C. Calculations

GSAS Water Suite™ automatically calculates the WPC value of the water use calculated and water use measured.

4.1.4 CRITERION LEVELS

1. Domestic Water Use- Calculated instead of Domestic Water Consumption- Calculated

Levels	Compliance with [W.1] Domestic Water Use Requirements - Calculated
0	$WPC_{cal} > 0.90$
1	$0.85 < WPC_{cal} \leq 0.90$
2	$0.80 < WPC_{cal} \leq 0.85$
3	$WPC_{cal} \leq 0.80$

2. Domestic Water Use- Measured instead of Domestic Water Consumption- Measured

Levels	Compliance with [W.1] Domestic Water Use Requirements – Measured
0	$WPC_{meas} > 0.90$
1	$0.85 < WPC_{meas} \leq 0.90$
2	$0.80 < WPC_{meas} \leq 0.85$
3	$WPC_{meas} \leq 0.80$

Note: The overall level is based on the calculated average of (WPC_{cal}) and (WPC_{meas}) indicators.

Incentive Weights:

An incentive weight of 1.00% is awarded for monitoring the domestic water use.

4.1.5 SUBMITTALS

Submit GSAS Water Suite™ together with the documents and auxiliary calculations supporting all the input values, including:

- Narrative linking the input data with the supporting documents.
- As-built drawings for all temporary buildings on-site, including offices, workers accommodation, washing facilities, canteens, toilets, and other welfare facilities.
- Auxiliary calculations justifying the input values, as applicable.
- Documents illustrating the water fixtures flow rates, for example, manufacturers data sheets or videos showing the flow rate measurement.
- Records of the water meter readings.
- Photographs of water fixtures.
- Single-line diagram showing the temporary buildings and the location of the meters.
- Evidences of the manpower for example approved monthly HSE reports.
- If the incentive score is targeted, submit records of the domestic water consumption, including a summary with the monthly readings of the meters, photos of the meters installed on site and a single line diagram showing the water tanks, water facilities and location of meters.

4.2 [W.2] NON-DOMESTIC WATER USE

4.2.1 PURPOSE

To minimize the non-domestic water consumption associated with construction activities.

4.2.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to manage and minimize non-domestic water use associated with construction activities including dust suppression, back-filling, concrete curing, housekeeping, testing and commissioning etc.

The Project will prepare a non-domestic water use **report** to establish the **criterion level**.

4.2.3 ASSESSMENT

4.2.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of [W.2] Non-domestic Water Use Checklist with a minimum degree of 70% compliance.
- Substantial compliance is achieved when the report demonstrates implementation of [W.2] Non-domestic Water Use Checklist with a minimum degree of 80% compliance.
- Full compliance is achieved when the report demonstrates implementation of [W.2] Non-domestic Water Use Checklist with a minimum degree of 90% compliance.
- Assess the site surroundings for available connections to the existing water mains and engage the local authorities for required permits if applicable.
- Assess the logistics and construction activities for non-domestic water use, to ensure water consumption is minimized.
- Implement on-site the methods and measures outlined in the GSAS-CM Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed non-domestic water needs associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.
- If the incentive score is targeted, install meters to measure the overall non-domestic water consumption and prepare records of the consumption data for submission.

4.2.3.2 Report

Prepare a Non-Domestic Water Use Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, including:

- Narrative describing the project non-domestic water activities, challenges encountered by the Project, strategies adopted to manage water use for non-domestic activities; in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Records of overall non-domestic water consumption.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents proving the implementation on-site, listed in [W.2] Non-Domestic Water Use Checklist. If necessary, provide justification of non-applicability of any of the methods and measures outlined in the Guidelines Manual.
- Brief on targeted activities or challenges for the next stage.
- Completed [W.2] Non-Domestic Water Use Checklist determining the submitted criterion level.

4.2.4 CRITERION LEVELS

Levels	Compliance with [W.2] Non-Domestic Water Use Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates partial compliance.
2	Report demonstrates substantial compliance.
3	Report demonstrates full compliance.

Incentive Weights:

An incentive weight of 1.00% is awarded for monitoring the non-domestic water use.

4.2.5 SUBMITTALS

- Submit the Non-Domestic Water Use Report which includes the narrative summarizing the status of non-domestic water use relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [W.2] Non-Domestic Water Use Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [W.2] Non-Domestic Water Use Checklist.
- If the incentive score is targeted, submit records of the non-domestic water consumption, including a summary with the monthly readings of the meters, photos of the meters installed on site and a single line diagram showing the water tanks, non-domestic water facilities and location of meters.

5.0 [M] MATERIALS

The Materials category considers aspects related to conservation of natural resources, minimizing soil disposal, and the use of certified materials with enhanced environmental, health and resources conservation attributes for temporary works.

IMPACTS

Environmental impacts resulting from unsustainable material use include:

- Materials depletion,
- Climate change,
- Fossil fuel depletion,
- Air, water and land pollution.

MITIGATE IMPACT

Measures that could mitigate environmental impact due to unsustainable use of materials include:

- Diverting existing waste materials from landfill or incineration,
- Using certified products and materials with enhanced environmental, health and resources conservation attributes,
- Minimize transportation and disposal of soil through reuse and optimization of cut and fill balance.

CRITERIA IN THIS CATEGORY

No.	Criterion	Level		Weight	Incentive Weight
		Min	Max		
M.1	Materials Diversion from Landfill	0	3	3.00%	
M.2	Materials Eco-Labeling	0	3	4.00%	2.00%
M.3	Cut & Fill Optimization	0	3	3.00%	
Total				10.00%	2.00%

5.1 [M.1] MATERIALS DIVERSION FROM LANDFILL

5.1.1 PURPOSE

To maximize the quantity of existing on-site waste material diverted from landfill or incineration.

5.1.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to maximize the quantity of existing on-site waste building materials and structures diverted from landfill or incineration. The diversion considers:

- Reuse on-site.
- Reuse off-site.
- Recycling.

The Project will complete the **calculator** for [M.1] Materials Diversion from Landfill to establish the **criterion level**.

5.1.3 ASSESSMENT

Project will perform the following per construction stage.

5.1.3.1 General

- Identify the existing building materials on-site and list those potentially reusable or recyclable.
- Identify from the existing building materials those matching the project design specifications to be reused on-site.
- Identify existing building materials that could be reused at other construction sites or facilities.
- Identify the existing building materials that can be recycled in available in-country recycling facilities.
- Dispose of, as a last resort, the existing building materials to an authorized landfill or incineration facility.
- Implement a comprehensive tracking system for the collection and disposal of all types of existing building materials, including quantities, date, type and destination.
- Develop the tracking system consistent with the unit of measurement, either cubic meter (m³) or ton (t).
- Input the data into [M.1] Materials Diversion from Landfill Calculator to determine the percentage of existing building materials diverted from landfill or incineration.
- Prepare all applicable documentation to back up the data entered in the calculator.

- Note that excavated soil is excluded from the assessment as it is part of [M.3] Cut & Fill Optimization criterion assessment.

5.1.3.2 Calculator

A. Inputs

Project Information

- Complete the date of submission, project name and GSAS Project ID.

Part 1 – Percentage of Diverted Materials

- Select the materials measurement unit, either cubic meter or ton. All data entered in the calculator should be measured in the selected unit.
- Type of Existing Material: enter in this column the type of existing material that has been salvaged or disposed of from site.
- Quantity of Material Sent to Landfill or Incineration: enter in this column the volume (m³) or weight (t) of the material that has either been disposed at a landfill or incinerated.
- Quantity of Material Reused On-site: enter in this column the volume (m³) or weight (t) of the material that has been reused on-site.
- Quantity of Material Reused Off-Site: enter in this column the volume (m³) or weight (t) of the material that has been sent to another site for further reuse.
- Quantity of Material Recycled: enter in this column the volume (m³) or weight (t) of the material that has been disposed of at a recycling facility.

B. Calculations

- Total Quantity of Existing Material = sum of either the volume (m³) or weight (t) of the type of existing material on-site.
- Total Quantities = sum of either the volume (m³) or weight (t) of the existing materials either:
 - taken to landfill or incineration.
 - reused on-site.
 - reused off-site.
 - recycled.
- Total Quantity of Existing Materials = sum of either the volume (m³) or weight (t) of the existing materials on-site.

- Total Quantity of Materials Diverted from Landfill or Incineration = sum of either the volume (m³) or weight (t) of existing materials:
 - reused on-site.
 - reused off-site.
 - recycled.
- Percentage of Materials Diverted from Landfill or Incineration (X) = percentage, by weight or volume of materials diverted from landfill or incineration to the total existing materials.

5.1.4 CRITERION LEVELS

Levels	Compliance with [M.1] Materials Diversion from Landfill Requirements
0	$X < 30\%$
1	$30\% \leq X < 50\%$ or not applicable
2	$50\% \leq X < 70\%$
3	$X \geq 70\%$

5.1.5 SUBMITTALS

- Submit a narrative explaining the condition of the existing materials found on-site and their usability, challenges encountered by the Project, and the main strategies adopted to divert the materials found from land fill or incineration, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Submit [M.1] Materials Diversion from Landfill Calculator together with the supporting documentation, including:
 - At least one collection Waste Transfer Note (WTN) per type of material and month, signed by both originator and transporter.
 - At least one disposal WTN per type of material and month, signed by both transporter and disposal facility.
 - All the collection invoices or monthly logs issued by the transporter, showing the quantities per type of material.
 - All the disposal invoices or monthly logs issued by the disposal facility, showing the quantities per type of material.

- Evidence of the reuse of the materials on-site, for example Material Approval Requests approved by the Client, as applicable.
- Photographs and videos as appropriate;
- Any other supplementary documents or evidences the Project considers necessary to provide a comprehensive explanation and justification linking the value inputs in the calculator with the data in the supporting documents, including auxiliary calculations as applicable.

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 for temporary construction activities.

5.2.2 ASSESSMENT PRINCIPLES

The Project will **assess** the number of products and materials with GSAS approved certification for eco-labeling used for temporary construction activities.

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 temporary construction materials with eco-labels.

Temporary construction materials are materials that will be removed from site before the handover of the construction project.

Eco-labeled materials are materials labeled with GSAS approved certification which can be categorized as follows:

- Materials with Environmental Product Declaration (EPD) certification.
- Multi-attribute materials certification.
- Single-attribute materials certification.

The calculator determines the indicator based on the availability fraction of eco-labeled materials used in the temporary buildings or in construction activities.

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

5.2.3.1 General

Project will perform the following per construction stage.

- Determine potential eco-labeled materials that can be used in the temporary buildings including offices, welfare facilities, warehouse and workshops. or in construction activities.
- Determine potential eco-labeled materials that can be used in the construction activities.
- Input the data into [M.2] Materials Eco-Labeling Calculator to determine the availability fraction of eco-labeled temporary construction materials.
- Prepare all applicable documentation to support the data entered in the calculator.

5.2.3.2 Calculator

A. Inputs

Project Information

- Complete the date of submission, project name and GSAS Project ID.

Part 1 – Materials Eco-Labeling

- Description of Temporary Material with Eco-Labeling: enter in this column a brief description of the temporary building materials with eco-labeling. Include in the descriptions of the name of the manufacturer of the supplied materials and products.
- Eco-Label Type: select from the pulldown menu the type of eco-labeled materials among:
 - Single-Attribute material.
 - Multi-Attribute Material.
 - Material with EPD.

B. Calculations

- Availability Fraction = calculated value based on the eco-labeling of materials.
- Total availability fraction of Eco-labeled Materials (X) = sum of the availability fractions of all materials.

5.2.4 CRITERION LEVELS

Levels	Compliance with [M.2] Materials Eco-Labeling Requirements
0	$X < 0.75$
1	$0.75 \leq X < 1.25$
2	$1.25 \leq X < 2$
3	$X \geq 2$

Incentive Weights:

An incentive score of 1.0% is awarded per additional eco-labeled temporary material up to 2% max.

5.2.5 SUBMITTAL

- Submit a narrative explaining the potential uses of eco-labeled materials, challenges encountered by the Project, and the main strategies adopted to use eco-labeled materials, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Submit [M.2] Materials Eco-labeling Calculator together with the supporting documentation, including:
 - Certificates of the eco-labeled materials.
 - Evidence of the use of the materials on-site, for example Material Approval Requests approved by the Client.
 - Photographs and videos as appropriate.
- Any other supporting documents or evidences that demonstrate compliance.

5.3 [M.3] CUT & FILL OPTIMIZATION

5.3.1 PURPOSE

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

5.3.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to maximize the quantity of soil diverted from landfill through:

- Optimization of cut and fill balance.
- Reuse of excavated material on-site.
- Reuse of excavated material off-site.
- Reuse of soil from off-site sources.
- Recycling of excavated material on-site.

The Project will complete the **calculator** for [M.3] Cut & Fill Optimization to establish the **criterion level**.

5.3.3 ASSESSMENT

5.3.3.1 General

- Analyze the project designed cut and fill balance and adjust the earthworks design to optimize the cut and fill balance whenever possible.
- Conduct tests of the excavated soil and based on its characteristics identify where applicable:
 - suitable reuses on-site.
 - recycling processes for the excavated material for further reuse on-site.
 - identify other construction sites where the excavated material could potentially be reused.
- Identify where applicable and based on the project design specifications requirements of the fill material.
 - other construction sites with surplus excavated material suitable as fill material on-site.
 - stockpiling facilities with stockpiled material suitable as fill material on-site.
- Identify stockpiling facilities to dispose of the surplus excavated material for further reuse at other projects.
- Dispose of, only as a last resort, the excavated material to an authorized landfill.

- Import virgin materials for the filling activities after exploiting all possible venues for utilizing non-virgin materials.
- Implement a comprehensive tracking system for the collection and disposal of all types of excavated materials identifying date, origin, destination, volume and type of material.
- Input the data into [M.3] Cut & Fill Optimization Calculator to determine the performance indicator.
- Prepare all applicable documentation to support the data entered in the calculator.

5.3.3.2 Calculator

A. Inputs

Project Information

- Complete the date of submission, project name and GSAS Project ID.

Part 1 – Cut

- Amount of materials excavated: enter in this cell the total volume in m³ of excavated material.
- Amount of materials sent to off-site stockpiling facility: enter in this cell the volume in m³ of excavated material transported to a stockpiling facility for future reuse.
- Amount of materials reused off-site: enter in this cell the volume in m³ of excavated material transported to a different construction site for reuse.

Part 2 – Fill

- Amount of materials filled on-site: enter in this cell the total volume in m³ of fill material used in earthworks, regardless of the source and type of fill material (soil, sand, gravel, etc.).
- Amount of materials reused from other construction sites: enter in this cell the total volume in m³ of fill material sourced from other construction sites.
- Amount of materials reused on-site: enter in this cell the total volume in m³ of fill material sourced from on-site excavated material.
- Amount of materials recycled on-site: enter in this cell the total volume in m³ of fill material sourced from on-site recycled excavated material.
- Amount of materials reused from off-site stockpiling facilities: enter in this cell the total volume in m³ of fill material sourced from off-site stockpiling facilities.

B. Calculations

- Amount of Materials Sent to Landfill = Amount of (materials excavated – materials sent to off-site stockpiling facility - materials reused off-site - materials reused on-site - materials recycled on-site).
- Amount of Virgin Materials Imported = Amount of (materials filled – materials reused from other construction site – materials reused on-site – materials recycled on-site – materials reused from off-site stockpiling facilities).
- Weighted Fraction = Amount of material multiplied by the Weighting factor.
- Overall Weighted Fraction = Sum of all weighted fractions.
- Maximum Value of Excavated and Filled = maximum value between the amount of materials excavated and the amount of materials filled.
- Cut & Fill Performance Indicator (X) = Percentage of the overall weighted fraction to the maximum value of excavated and filled.

5.3.4 CRITERION LEVELS

Levels	Compliance with [M.3] Cut & Fill Optimization Requirements
0	$X < 25\%$
1	$25\% \leq X < 50\%$
2	$50\% \leq X < 80\%$
3	$X \geq 80\%$

5.3.5 SUBMITTALS

- Submit a narrative explaining the existing conditions of cut and fill on-site, challenges encountered by the Project, and the main strategies adopted to use cut and fill materials, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Submit [M.3] Cut & Fill Optimization Calculator together with the supporting documentation, including:
 - At least one Collection Transfer Note per type of material and month, signed by both originator and transporter.
 - At least one Delivery Transfer Note per type of material and month, signed by both transporter and destination site/facility.
 - All the collection invoices or monthly logs issued by the transporter, showing the quantities per type of material.
 - All the delivery invoices or monthly logs issued by the destination site/facility, showing the quantities per type of material.
 - Earthworks drawings approved by the Client.
 - Evidence of excavated and filled quantities, for example bill of quantities approved by the Client.
 - Evidence of the use of the materials on-site, for example Material Approval Requests approved by the Client.
 - Photographs and videos as appropriate.
 - Auxiliary calculations as applicable.
- Any other supporting documents or evidences that demonstrate compliance.

6.0 [OE] OUTDOOR ENVIRONMENT

The Outdoor Environment category considers aspects related to dust control, noise and vibration control, light pollution/visual impact control and odor and VOC's control.

IMPACTS

Impacts resulting from ineffective control and design of the outdoor environment include:

- Air pollution,
- Human Comfort and Health Degradation.

MITIGATE IMPACT

Measures that could improve outdoor environmental quality during the construction process include:

- Minimizing the level of dust and fine particulates produced on-site,
- Minimizing the amount of noise generated due to construction activities,
- Reducing the vibration impacts from different construction equipment,
- Minimizing light pollution and negative visual impacts,
- Minimizing odor and reducing level of VOC emissions in the air.

CRITERIA IN THIS CATEGORY

No.	Criterion	Level		Weight	Incentive Weight
		Min	Max		
OE.1	Dust Control	0	3	8.00%	2.00%
OE.2	Noise & Vibration Control	0	3	6.00%	
OE.3	Light Pollution & Visual Impact Control	0	3	3.00%	
OE.4	Odor & VOC Emissions Control	0	3	2.00%	
Total				19.00%	2.00%

6.1 [OE.1] DUST CONTROL

6.1.1 PURPOSE

To minimize levels of dust and airborne particulates generated by construction activities.

6.1.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to control and minimize the level of dust and airborne particulates (PM10 and PM2.5) generated by construction activities.

The Project will prepare dust and airborne particulates management **reports** and complete the **calculator** for [OE.1] Dust Control to establish the **criterion level**.

6.1.3 ASSESSMENT

6.1.3.1 General

The assessment of this criterion is both prescriptive and performance based. The prescriptive part is based on the degree of compliance of the Dust Control Report, which demonstrates the implementation of the methods and measures during the construction stage.

The performance-based parameters depend on the compliance of the monitored dust levels (PM10 and PM2.5) against GSAS limits or local regulations. PM10 is particulate matter of less than 10 µm in diameter, and PM2.5 is particulate matter of less than 2.5 µm in diameter.

- Identify the sensitive receptors potentially affected by dust generated from the construction site.
- Identify and assess the potential impacts of construction activities generating dust.
- Implement dust levels monitoring as per the requirements described under Dust Monitoring section.
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of dust associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

- Input the data into [OE.1] Dust Control Calculator to determine the PM10 and PM2.5 levels, following the instructions outlined in the calculator section.
- When dust levels are monitored as per the local regulations, provide the data measurements, project review findings and the approval by the local authorities.
- When the dust levels are monitored as per the GSAS-CM methodology, prepare all applicable documentation to support the values entered in the calculator.
- If the incentive score is targeted, monitor the dust levels continuously as per the GSAS-CM methodology.

6.1.3.2 Report

Prepare a Dust Control Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing dust conditions on-site, challenges encountered by the Project, and the main strategies adopted to manage dust control, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Layout drawings showing sensitive receptors and dust sources.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [OE.1] Dust Control Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [OE.1] Dust Control Checklist.

6.1.3.3 Dust Monitoring

The Project may choose to monitor the dust levels either following the local regulations or GSAS-CM dust monitoring methodology.

Case A - Dust Monitoring as Per Local Regulations

The Project shall monitor the dust levels following the local regulations and will obtain the approval from the relevant local authorities.

Case B - Dust Monitoring as Per GSAS-CM Methodology

The Project shall measure the concentrations of particulate matter (PM10 and PM2.5) along the site boundary during construction. Depending on the available equipment, three different dust monitoring methods have been developed. The timing, location of the monitoring points and assessment are different for each method. The methods are as follows:

1. Dust monitoring using 4 pieces of equipment simultaneously.
2. Dust monitoring using 2 pieces of equipment simultaneously.
3. Dust monitoring using 1 piece of equipment.

I. Dust Monitoring Methods

1. Using 4 Pieces of Equipment Simultaneously

a.) Monitoring Schedule

Monitoring must be performed during two different Monitoring Periods within the same Construction Stage. Note: GSAS considers 3 Construction Stages in every project. These two different Monitoring Periods will be selected within the peak construction activity of every Construction Stage.

The Project will monitor both dust levels PM10 and PM2.5 during at least 2 consecutive working days (excluding off-days) per monitoring period resulting in monitoring of 4 working days per Construction Stage, as shown in the timeline diagram below (Figure OE.1.1).

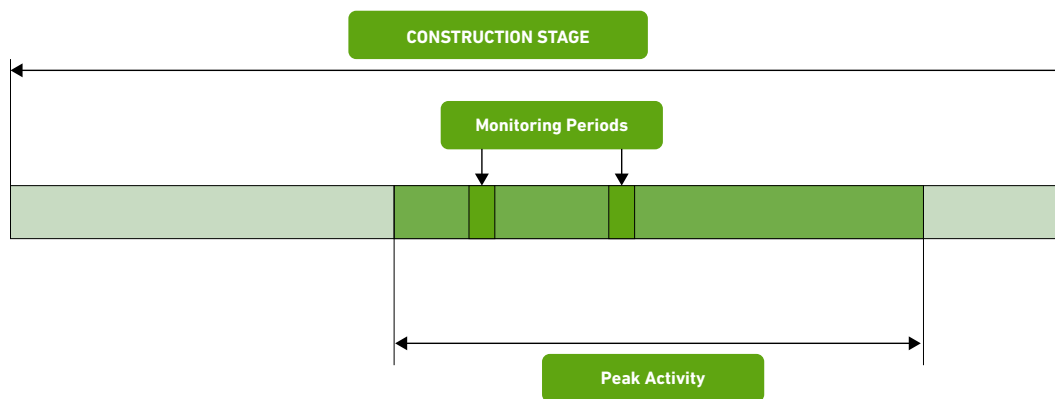


Figure OE.1.1 Timeline diagram for monitoring PM10 and PM2.5 using four pieces of equipment

b.) Location of the Monitoring Points

The four monitoring points shall be located along the site boundary preferably as follows considering the direction of the forecast prevailing wind:

- One upwind of the construction activity.
- One downwind of the construction activity to ensure the dust potentially generated by the construction activities is measured.
- The remaining two should be located at each end of a line perpendicular to the direction of the first two points.

The location of the monitoring points shall not be changed for 24 hours, following which the Project may decide to relocate them to different locations depending on the forecast wind direction. After the relocation, the monitoring points shall remain unchanged for the following 24 hours (Refer to Figure OE.1.2 for more details).

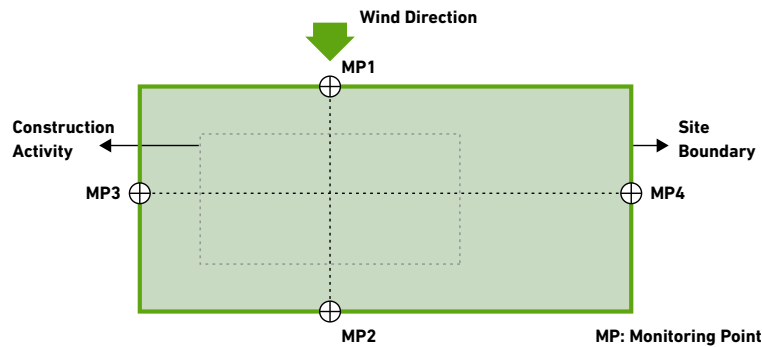


Figure OE.1.2 Location of monitoring points using four pieces of equipment

Note: The monitoring equipment should be elevated to capture the dust travelling over any perimeter site fence.

2. Using 2 Pieces of Equipment Simultaneously

a.) Monitoring Schedule

Monitoring shall be performed during 3 different Monitoring Periods within the same Construction Stage. These 3 different Monitoring Periods will be selected within the peak construction activity of every Construction Stage.

The Project will monitor both dust levels PM₁₀ and PM_{2.5} during at least 4 consecutive working days (excluding off-days) per Monitoring Period resulting in the monitoring of 12 working days per Construction Stage, as shown in the timeline diagram below (Figure OE.1.3).

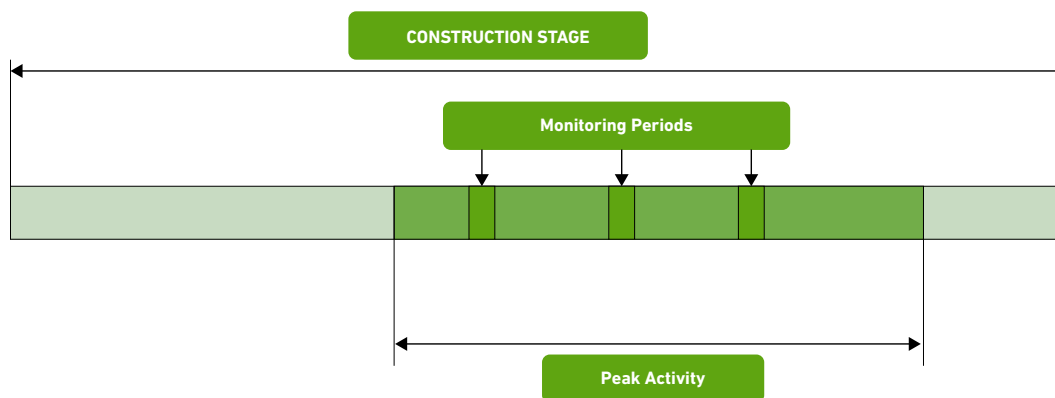


Figure OE.1.3 Timeline diagram for monitoring PM₁₀ and PM_{2.5} using two pieces of equipment.

b.) Location of the Monitoring Points

The monitoring points shall be located along the site boundary preferably as follows considering the direction of the forecast prevailing wind:

- One upwind of the construction activity.
- One downwind of the construction activity to ensure that the dust potentially generated by the construction activities is measured.

The location of the monitoring points shall not be changed for 24 hours, following which the Project may decide to relocate them to a different location considering the forecast prevailing wind direction. After the relocation, the monitoring points shall remain unchanged for the following 24 hours (refer to Figure OE.1.4 for more details).

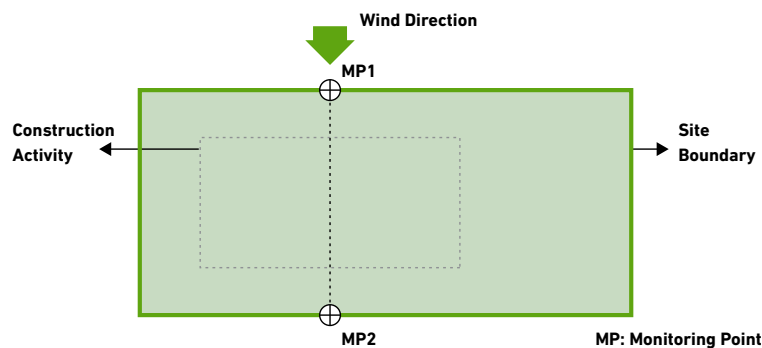


Figure OE.1.4 Location of monitoring points using two pieces of equipment

3. Using 1 Piece of Monitoring Equipment

a.) Monitoring Schedule

Monitoring shall be performed during 3 different Monitoring Periods within the same Construction Stage. These 3 different Monitoring Periods will be selected within the peak construction activity of every Construction Stage.

The Project will monitor both dust levels PM₁₀ and PM_{2.5} during at least 8 consecutive working days (excluding off-days) per Monitoring Period resulting in monitoring of 24 working days per Construction Stage, as shown in the timeline diagram below (Figure OE.1.5).

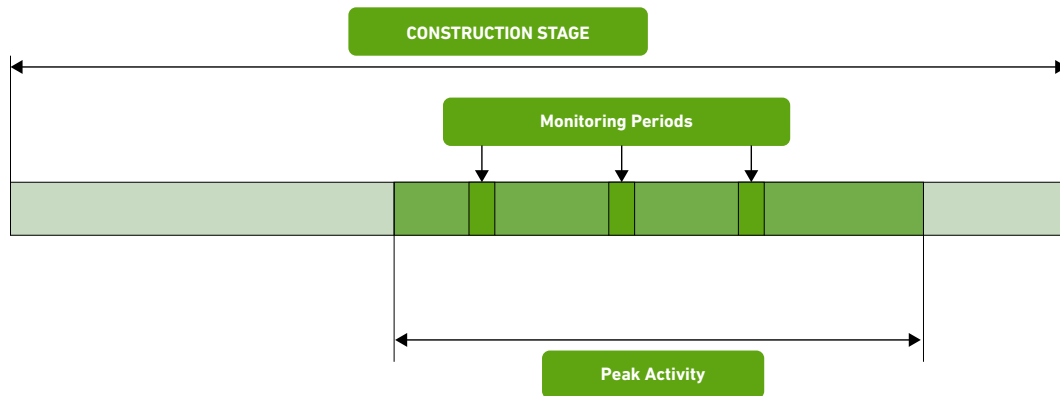


Figure OE.1.5 Timeline diagram for monitoring PM10 and PM2.5 using one piece of equipment

b.) Location of the Monitoring Point

The monitoring points shall be located along the site boundary preferably as follows considering the direction of the forecast prevailing wind:

- Upwind of the construction activity for any four days during the monitoring period.
- Downwind of the construction activity for any four days during the monitoring period to ensure that the dust potentially generated by the construction activities is measured.

The location of the monitoring point shall not be changed for at least 24 hours, then the Project may consider relocating it to a different location (upwind or downwind) depending on the forecast prevailing wind direction for the following 24 hours. After the relocation, the monitoring point shall remain unchanged for the next 24 hours (refer to Figure OE.1.6 for more details).

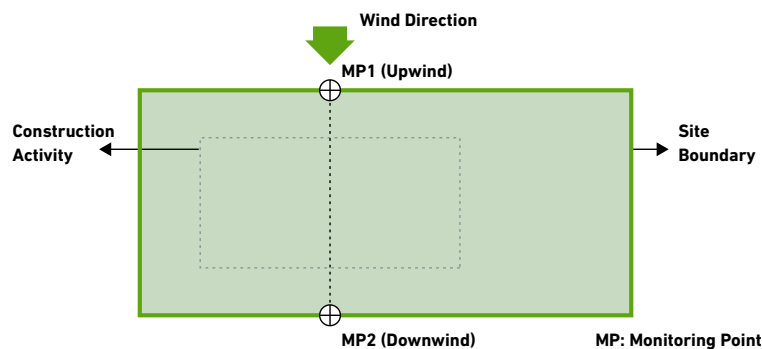


Figure OE.1.6 Location of monitoring points using one piece of equipment

The table below summarizes the methods of dust monitoring.

No. of Equipment	No. of Monitoring Periods	Length of Monitoring Period	Location of Monitoring Points
4	2 Periods per Construction Stage	2 Consecutive working days	– Point 1 upwind. – Point 2 downwind. – Points 3 and 4 at the ends of a line perpendicular to the direction of the first two points.
2	3 Periods per Construction Stage	4 Consecutive working days	– Point 1 upwind. – Point 2 downwind.
1	3 Periods per Construction Stage	8 Consecutive working days	– Point 1 upwind. – Point 2 downwind.

II. Assessment Methods

1. Method-1: Meeting GSAS Limits

30-minute average measured PM₁₀ and PM_{2.5} values will be input in [OE.1] Dust Control Calculator. For both PM₁₀ and PM_{2.5}, the calculator will compute the maximum average value per Construction Stage, which should be equal or below the correspondent GSAS limit in order to achieve the related level. If the maximum average value is above GSAS limits the Project may use Method-2.

$$\text{PM}_{10} \leq 150 \mu\text{g}/\text{m}^3$$

$$\text{PM}_{2.5} \leq 35 \mu\text{g}/\text{m}^3$$

2. Method-2: Meeting the Background Limits

The Project may take advantage of simultaneous readings combined with wind direction and speed to estimate background dust levels. Readings upwind of the construction activity may be considered as background dust provided that:

- The monitoring point is located at least 15 meters away from the construction activity.
- The average wind speed is equal to or greater than 1.3 m/s.

The Project shall submit a report comparing the measured levels to the existing background dust levels. This report shall include:

- The methodology used to estimate the background levels.
- Comparison proving actual dust levels do not exceed the background levels.

The report will be analyzed by GSAS Trust.

III. Continuous Monitoring

An incentive of 2% will be awarded for additional efforts on continuous monitoring of the required parameters.

Project will achieve the 2% incentive weight provided that continuous monitoring for both PM10 and PM2.5 is performed in at least one location, 24 hours a day during the whole Construction Stage.

It is highly recommended that Project perform continuous monitoring using at least two pieces of equipment, upwind and downwind of the construction site, orientated in the direction of the prevailing wind. Therefore, the Project may take advantage of continuous and simultaneous measures to estimate the background levels.

Note: if the purchased equipment can read either PM10 or PM2.5, the measurements will be accepted for incentive score if complied with an agreed-on interval. In such cases, the contractor will be required to coordinate the interval with GSAS Trust.

6.1.3.4 Calculator

A. Inputs

Project Information

- Complete the date of submission, project name and GSAS Project ID.

Part 1 – Dust Monitoring and Control Report

- Dust Control Report (X): select from the drop-down menu whether the Dust Control report is compliant or not.
- No. of Equipment: select from the drop-down menu the number of monitoring devices used (1, 2 or 4). Based on the selection, the calculator will automatically generate the necessary sheets and columns to enter the monitoring data.

Part 2 – Monitoring Periods 1, 2 and 3.

- α_1 and α_2 : enter here the azimuths of the boundary at the corresponding monitoring point. The azimuths are defined as follows:

The site boundary and the Monitoring Point (MP) form an angle as outlined in Figure OE.1.7.

- The Monitoring Point is the vertex of the angle.
- The construction site is the interior side of the angle.
- The monitoring point is established by dividing the site boundary between the two arms of the angle (Arm 1 and Arm 2).

Arms 1 and 2 are determined as follows:

- Looking from within the construction site towards the Monitoring Point, Arm 1 extends from the Monitoring Point to the right, and Arm 2 to the left, in every instance.

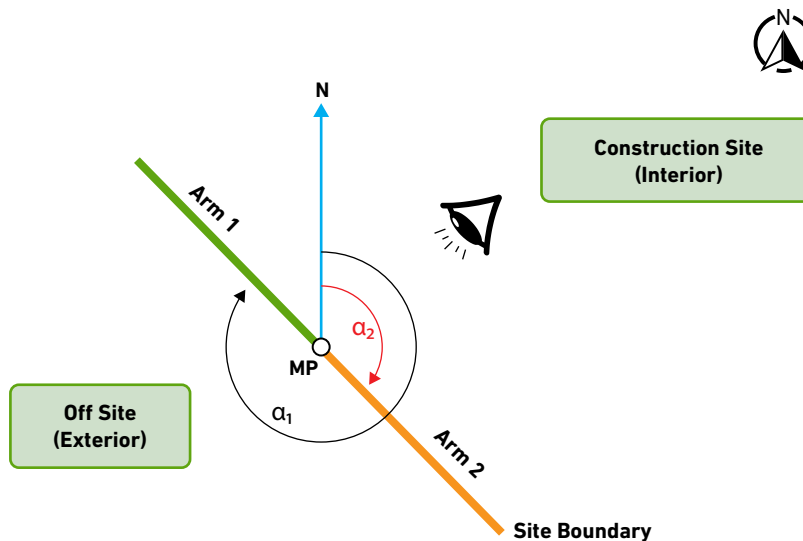


Figure OE.1.7 Detailed monitoring point structure

The azimuths that determine the angle are:

- Azimuth 1 (α_1) for Arm 1.
- Azimuth 2 (α_2) for Arm 2.

Note: The azimuth is the angle of horizontal deviation, measured clockwise, of a direction from the North (see Figure OE.1.8).

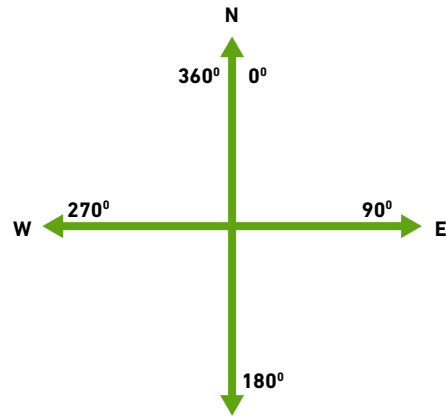


Figure OE.1.8 Azimuths Measurements

Figure OE.1.9 represents a typical example of a construction site; defining Arm 1, Arm 2, α_1 and α_2 for four different locations of monitoring points.

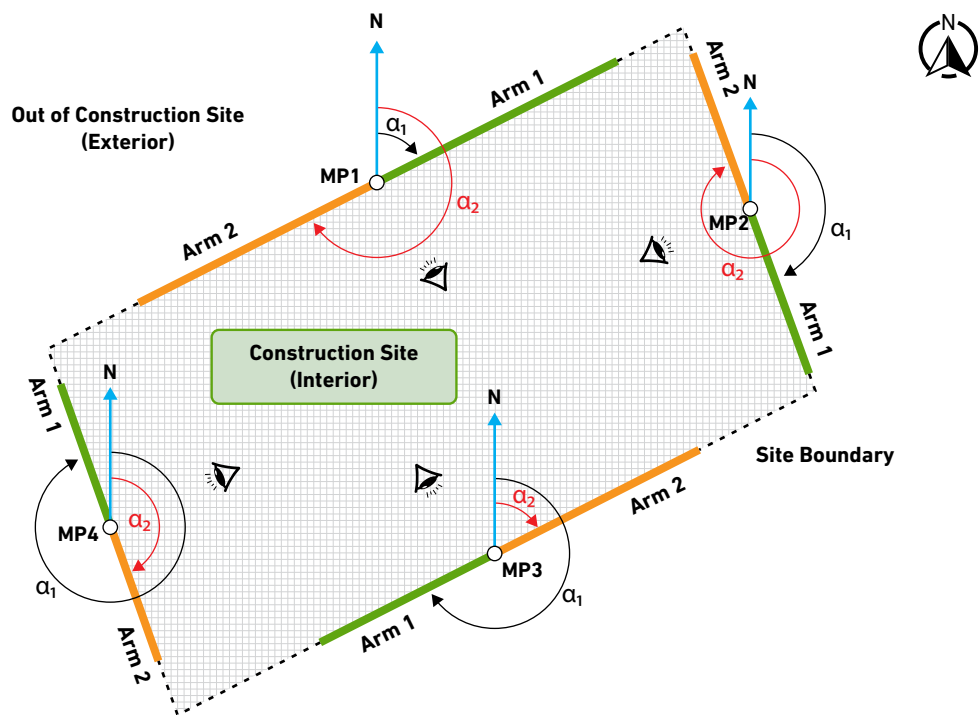


Figure OE.1.9 A typical site set up

- PM2.5 value (mg/m³): enter the PM2.5 concentration corresponding to the monitoring period, day, monitoring point, and time of the day.
- PM10 value (mg/m³): enter the PM10 concentration corresponding to the monitoring period, day, monitoring point, and time of the day.
- Wind direction (β): enter the azimuth of the wind direction corresponding to the monitoring period, day, monitoring point, and time of the day. Follow the instructions in the calculator to determine the azimuth of the wind direction.
- Wind speed (m/s): enter the wind speed corresponding to the monitoring period, day, monitoring point, and time of the day.

B. Calculations

Part 1 – Dust Monitoring and Control Report

- (X) = calculated PM10 dust and airborne particulates compliance.
- (Y) = calculated PM2.5 dust and airborne particulates compliance.
- [OE.1] criterion level = the generated criterion level for [OE.1] Dust Control based on the specified range from the criterion levels.

Part 2 – Monitoring Periods 1, 2 and 3.

- 48-hour average PM2.5 (mg/m³) = average of all the valid downwind PM2.5 values for the corresponding 48 hours and monitoring point. A value is considered valid in these two cases:
 - The wind speed is greater than 1.3 m/s and the wind is blowing from the site.
 - The wind speed is below 1.3 m/s regardless of the wind direction.

The cell is blank if less than half of the values are valid. In this case the corresponding 2-day period is ignored.

- 48-hour average PM10 (mg/m³) = similarly, average of all the valid downwind PM10 values for the corresponding 48 hours and monitoring point.
- Compliance of the 48-hour average PM2.5 values = Compliant if the average is below 35 mg/m³.
- Compliance of the 48-hour average PM10 values = Compliant if the average is below 150 mg/m³.

6.1.4 CRITERION LEVELS

Levels	Compliance with [OE.1] Dust Control Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates compliance.
2	Report demonstrates compliance and dust monitoring is compliant with local regulations.
3	Report demonstrates full compliance and dust monitoring demonstrates full compliance.

Incentive Weights:

An incentive weight of 2.00% is awarded for continuous monitoring of dust.

6.1.5 SUBMITTALS

- Submit the Dust Control Report, which includes the narrative summarizing the status of dust control relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [OE.1] Dust Control Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [OE.1] Dust Control Checklist.
- If the Project monitors the dust following the local regulations, submit the written approval by the relevant local authorities of the monitored dust levels during the period of assessment.
- If the Project follows the GSAS-CM dust monitoring methodology, submit [OE.1] Dust Control Calculator together with the supporting documentation, including:
 - Monitoring raw data signed and stamped by the company who performed the monitoring, either the contractor or a specialized subcontractor.
 - Layout showing the location of the monitoring points and azimuths $\alpha 1$ and $\alpha 2$.
 - Photographs and videos as appropriate.
 - Any other supporting document or evidence that demonstrate compliance.
 - Where PM10 and/or PM2.5 levels are above GSAS limit, submit a report demonstrating the downwind dust levels are below the background limits, as explained under Dust Monitoring section.
- If the incentive score is targeted, submit as evidence of continuous monitoring, the PM10 and PM2.5 daily averages during the construction stage.

6.2 [OE.2] NOISE & VIBRATION CONTROL

6.2.1 PURPOSE

To minimize the levels of noise and vibration generated by construction activities, plant and equipment.

6.2.2 ASSESSMENT PRINCIPLES

The Project will assess the methods and measures implemented to control and minimize the levels ($L_{Aeq,T}$) of noise generated by construction activities.

The Project will prepare noise management **reports** and complete the **calculator** for [OE.2] Noise & Vibration Control to establish the **criterion level**.

6.2.3 ASSESSMENT

6.2.3.1 General

The assessment of this criterion is both prescriptive and performance based. The prescriptive part is based on the degree of compliance of the Noise & Vibration Control Report, which demonstrates the implementation of the methods and measures during the construction stage.

The performance-based parameters depend on the compliance of:

- the monitored noise levels affecting the neighborhood with the regulations from local authorities.
- the monitored noise levels of plant and equipment with BS 5228-1:2008+A1:2014 or equivalent standard.
- Identify the sensitive receptors potentially affected by noise and vibration generated from the construction site.
- Identify and assess the potential impacts of noise and vibration generated by construction activities.
- Assess the plant and equipment requirements for the project and ensure they are compliant with BS 5228-1:2008+A1:2014 or equivalent standard.
- Implement noise levels monitoring as per the requirements described under Noise Monitoring section.
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of noise and vibration associated with the construction activities.

- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.
- Input the data into [OE.2] Noise & Vibration Control Calculator to determine the sound pressure levels ($L_{Aeq, 20min}$) at the boundary, following the instructions given under the calculator section.
- Prepare all applicable documentation to support the values entered in the calculator.

6.2.3.2 Report

Prepare a Noise & Vibration Control Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of noise on-site, challenges encountered by the Project, and the main strategies adopted to manage noise and vibration control, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Layout drawings showing sensitive receptors and high-level noise sources.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [OE.2] Noise & Vibration Control Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [OE.2] Noise & Vibration Control Checklist.

6.2.3.3 Noise Monitoring

A. Noise Affecting the Neighborhood

- On-site measurements will be undertaken to determine whether the allowable sound levels stated by the local authorities have been exceeded by measuring equivalent sound pressure levels over 20-minute intervals ($L_{Aeq, 20min}$).
- The monitoring will take place at four measurement points on the site boundary, based on the shape of the site and location of adjacent sensitive receptors. The Project should propose the location of the monitoring points and obtain confirmation from GSAS Trust. The monitoring points will maintain a distance of not less than 15 meters from construction activities. When the site boundary is within 15 meters of a construction activity, the measurement point should be as close to the construction activity as possible while maintaining a 15-meter buffer (refer to example in Figure OE.2.1).

Note: the noise monitoring equipment will be placed 1.5 meters above ground.

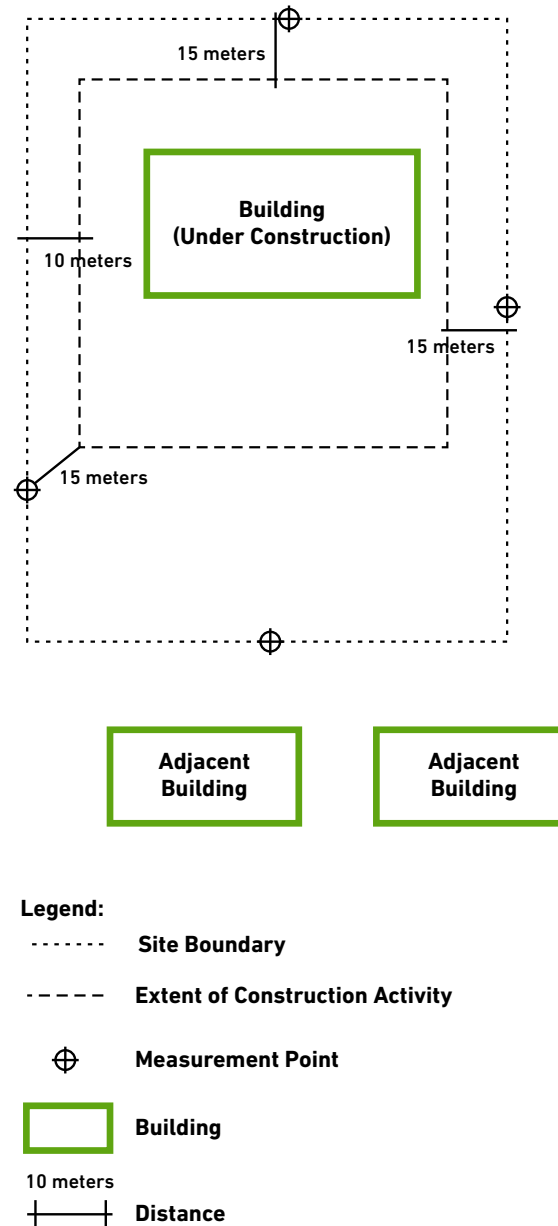


Figure OE.2.1 Plan location of noise monitoring points.

- Prior to commencement of the works, the Project will measure the background sound levels by measuring the sound levels at the four approved monitoring points. The monitoring will be conducted for a 24-hour period in each one of the four points, on consecutive working days. The monitoring equipment will be set to measure the $L_{Aeq, T}$ every 20 minutes.

- At each construction stage, the Project will measure the sound levels arising from the construction activities (sound levels generated during construction) by measuring the sound levels at the same four approved monitoring points. The monitoring will also be conducted for a 24-hour period at each one of the four points, on consecutive working days, during the construction stage peak activity. The monitoring equipment will be set to measure the $L_{Aeq, T}$ every 20 minutes.
- Both the background sound levels, and the sound levels generated during construction will be input in [OE.2] Noise & Vibration Control Calculator, following the instructions outlined under the Calculator section. The calculator will compare the sound levels generated during construction to the limits set by the local authorities. If all the $L_{Aeq, 20min}$ generated during construction are below the limits, the noise monitoring is considered compliant. Otherwise, the calculator will recalculate the limits based on a combination of the limits from the local authorities and the background sound levels. If all the $L_{Aeq, 20min}$ generated during construction are below the recalculated limits, the noise monitoring is considered compliant; otherwise, it is not compliant.
- Note: where background conditions change around the site affecting the neighborhood sound levels, for example: new adjacent construction works, the Project may conduct background noise monitoring again and use the new set of background sound levels in the calculator.

B. Noise from Plant and Equipment

The noise generated by plant and equipment especially affects the workers on-site; therefore, projects must ensure that low noise plant and equipment is utilized on-site to protect the health and safety of the workers.

The BS 5228-1:2009+A1:2014 or equivalent standard can be used as a reference for measuring the sound level generated by plant and mechanical equipment. It provides guidance concerning methods of predicting and measuring noise and assessing the impact on those exposed to it.

The scope of the monitoring is limited to noise-generating stationary and mobile equipment and plant operating on the construction site. This noisier equipment will be grouped depending on having similar specifications (brand, model, power rating, etc.) and similar construction activities. One sample equipment of each group will be monitored per stage.

For GSAS-CM the sound pressure level ($L_{Aeq, T}$) of the equipment will be measured at a distance of 10m in accordance with annexes C and D of BS 5228-1:2009+A1:2014.

Notes:

- Equipment surrounded with barriers within a 10-meter distance are excluded from the assessment.
- Equipment and plant should be measured while performing the construction activity, not while being idle and for a period of at least one hour.

6.2.3.4 Calculator

A. Inputs

Project Information

- Complete the date of submission, project name and GSAS Project ID.

Part 1 – Noise & Vibration Control Report

- Noise & Vibration Control Report: select from the drop-down menu whether the report is compliant or not.

Part 2 – Noise Monitoring – Plant & Equipment

- Noise Monitoring Report demonstrates compliance: select from the drop-down menu whether the report is compliant or not.

Part 3 – Noise Monitoring – Affecting the Neighborhood

- Location and Use: select from the drop-down menu the type of location and use of the surroundings to the construction site.
- Use of Background Sound Levels: select from the drop-down menu:
 - No. If the background sound levels are not required. Note: if the sound levels generated during construction are below the limits from the local authorities, there is no need to use the background levels for comparison.
 - Otherwise, select Yes.
- Sound Levels Generated During Construction: enter in these columns the $L_{Aeq, 20min}$ generated during construction correspondent to the monitoring point and time.
- Background Sound Levels: enter in these columns the background $L_{Aeq, 20min}$ correspondent to the monitoring point and time.

B. Calculations

- Maximum Limits:
 - If “No” is selected for Use of Background Sound Levels = limits from the local authorities for the correspondent Location Land Use and time.
 - If “Yes” is selected = maximum between the limits from local authorities and the correspondent background sound level.
- Noise Monitoring Compliance = “Yes” if all the sound levels generated during construction are below the limits. “No” otherwise.

6.2.4 CRITERION LEVELS

Levels	Compliance with [OE.2] Noise & Vibration Control Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates compliance.
3	Report demonstrates full compliance and noise monitoring are fully compliant.

6.2.5 SUBMITTALS

- Submit the Noise & Vibration Control Report, which includes the narrative summarizing the status of dust control relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [OE.2] Noise & Vibration Control Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [OE.2] Noise & Vibration Control Checklist.
- Submit [OE.2] Noise & Vibration Control Calculator together with the supporting documentation, including:
 - Monitoring raw data signed and stamped by the company who performed the monitoring, either the contractor or a specialized subcontractor.
 - Layout showing the location of the monitoring points.
 - Layout showing the neighborhood locations and their usage: residential, commercial or industrial.
 - Photographs and videos as appropriate.
 - Any other supporting document or evidence that demonstrate compliance.
- Submit [OE.2] Noise of Plant and Equipment Monitoring report, which includes:
 - Videos of noise monitoring the plant and equipment.
 - Specifications of the monitored plant and equipment.
 - Relevant excerpts of the Tables C.1 to C.12 of BS 5228-1:2008+A1:2014 or equivalent standard.
 - Table comparing the monitored noise levels with the correspondent BS 5228-1:2008+A1:2014 limits, or equivalent standard limits.

6.3 [OE.3] LIGHT POLLUTION & VISUAL IMPACT CONTROL

6.3.1 PURPOSE

To minimize light pollution and reduce the visual impact associated with construction activities.

6.3.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to control and minimize:

- Light pollution from the construction site,
- The visual impact of the construction site.

The Project will prepare light pollution and visual impact control **reports** to establish the **criterion level**.

6.3.3 ASSESSMENT

6.3.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of [OE.3] Light Pollution & Visual Impact Control Checklist - Part (A) Light Pollution OR Part (B) Visual Impact.
- Full compliance is achieved when the report demonstrates implementation of [OE.3] Light Pollution & Visual Impact Control Checklist - Part (A) Light Pollution AND Part (B) Visual Impact.
- Assess the site surroundings for potential sensitive receptors to light pollution.
- Assess the logistics and construction activity requirements of the project in terms of lighting to ensure a safe working environment.
- Assess the potential visual impacts of the logistics and construction activities on the adjacent sensitive receptors.
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts of light pollution and visual impact associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

6.3.3.2 Report

Prepare a Light Pollution & Visual Impact Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of light pollution and visual impact on-site, challenges encountered by the Project, and the main strategies adopted to manage light pollution and visual impact control, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Logistics layout drawings showing location of lighting fixtures.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [OE.3] Light Pollution & Visual Impact Control Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [OE.3] Light Pollution & Visual Impact Control Checklist.

6.3.4 CRITERION LEVELS

Levels	Compliance with [OE.3] Light Pollution & Visual Impact Control Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates partial compliance.
3	Report demonstrates full compliance.

6.3.5 SUBMITTALS

- Submit the Light Pollution & Visual Impact Report, which includes the narrative summarizing the status of light pollution and visual impact relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [OE.3] Light Pollution & Visual Impact Control Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [OE.3] Light Pollution & Visual Impact Control Checklist.

6.4 [OE.4] ODOR & VOC EMISSIONS CONTROL

6.4.1 PURPOSE

To minimize odors and VOC emissions arising from construction activities.

6.4.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to:

- Control and minimize odors emanating from the construction site.
- Manage the storage and handling of materials with volatile organic content used in construction activities.

The Project will prepare odor and volatile organic compound control **reports** to establish the **criterion level**.

6.4.3 ASSESSMENT

6.4.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of [OE.4] Odor & VOC Emissions Control Checklist - Part (A) Odor Control OR Part (B) VOC Emissions.
- Full compliance is achieved when the report demonstrates implementation of [OE.4] Odor & VOC Emissions Control Checklist - Part (A) Odor Control AND Part (B) VOC Emissions.
- Assess the site surroundings for potential sensitive receptors to odor and VOC emissions from the site.
- Assess the potential impacts of sources of odor and VOC emissions from the logistics and construction activities on-site on both the surrounding neighborhood and construction workers.
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the potential assessed impacts of odor and VOC emissions associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

6.4.3.2 Report

Prepare an Odor & VOC Emissions Control Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of odor and VOC emissions on-site, challenges encountered by the Project, and the main strategies adopted to manage odor and VOC emissions control, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Logistics layout drawings showing location of potential odor and VOC emissions sources as well as receptors.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [OE.4] Odor & VOC Emissions Control Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [OE.4] Odor & VOC Emissions Control Checklist.

6.4.4 CRITERION LEVELS

Levels	Compliance with [OE.4] Odor & VOC Emissions Control Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates partial compliance.
3	Report demonstrates full compliance.

6.4.5 SUBMITTALS

- Submit the Odor & VOC Emissions Control Report, which includes the narrative summarizing the status of Odor & VOC Emissions relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [OE.4] Odor & VOC Emissions Control Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [OE.4] Odor & VOC Emissions Control Checklist.

7.0 [SD] SOCIO-CULTURAL DIMENSIONS

The Socio-Cultural Dimensions category considers aspects related to cultural conservation, protection of archeological remains and heritage sites, society engagement and effective control and design of Socio-Cultural Interactions. This category is applicable if any archeological or heritage elements are discovered during the construction works.

IMPACTS

Impacts resulting from the non-protection of archeological remains or heritage sites, and ineffective control and design of the Socio-Cultural Interactions include:

- Loss of cultural heritage,
- Loss of society wellbeing,
- Missed opportunities to build mutual trust between society and the needs of construction practices.

MITIGATE IMPACT

Factors that could mitigate the impact include:

- Identifying archeological sites to prevent damage by excavation,
- Identifying heritage items or relics for protection against site activities,
- Implementing an effective control and design of Socio-Cultural Interactions.

CRITERIA IN THIS CATEGORY

No.	Criterion	Level		Weight
		Min	Max	
SD.1	Protection of Archeological Remains	0	3	2.00%
SD.2	Socio-Cultural Interaction	0	3	3.00%
Total				5.00%

7.1 [SD.1] PROTECTION OF ARCHAEOLOGICAL REMAINS

7.1.1 PURPOSE

To protect archeological remains present on the construction site.

7.1.2 ASSESSMENT PRINCIPLES

The Project will **assess** the management procedures and protocols to be followed for the protection of archeological remains discovered or known to be present on the construction site.

The Project will prepare a protection of archaeological remains **report** to establish the **criterion level**.

7.1.3 ASSESSMENT

7.1.3.1 General

- Partial compliance is achieved when the report demonstrates no part of the site has any archeological value.
- Full compliance is achieved when the report demonstrates implementation of [SD.1] Protection of Archeological Remains Checklist.
- Conduct an archaeological survey of the construction site prior to commencement of the works, as per the relevant authorities' requirements.
- Obtain a "No Objection" advisory to proceed with the works from the relevant authority.
- Provide training to the workers on how to proceed in the event any remains are found during construction activities.
- Assess the potential impacts of the logistics and construction activities on the archaeological remains if found on the site.
- Implement on-site the methods and measures outlined in the GSAS-CM Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed potential impacts and damage to archeological remains existing or discovered on the construction site.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

7.1.3.2 Report

Prepare a Protection of Archaeological Remains Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of the site, relevant challenges encountered by the Project, and the main strategies adopted to manage protection of archeological remains if exist, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Permits from the relevant authorities.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [SD.1] Protection of Archeological Remains Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [SD.1] Protection of Archeological Remains Checklist.

7.1.4 CRITERION LEVELS

Levels	Compliance with [SD.1] Protection of Archeological Remains Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates site has no archeological value.
3	Report demonstrates full compliance.

7.1.5 SUBMITTALS

A) Site with Archeological Value

- Submit [SD.1] Protection of Archaeological Remains Report, which includes the narrative summarizing the status of protection of archaeological remains relevant to the construction stage where applicable.

- Documents proving the implementation of each one of the methods and measures as outlined in [SD.1] Protection of Archeological Remains Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [SD.1] Protection of Archeological Remains Checklist.

B) Site with No Archeological Value

- Permit to proceed with the works issued by relevant local authority.
- Evidence of training for example signed attendance sheets and content slides including actions to be taken in case any archaeological remains are found.

7.2 [SD.2] SOCIO-CULTURAL INTERACTION

7.2.1 PURPOSE

To establish communication and interaction protocols with the local community and stakeholders for addressing public concerns and feedback.

7.2.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to encourage interaction and feedback from the local community and stakeholders including residents, businesses, authorities, etc.

The Project will prepare socio-cultural interaction **reports** to establish the **criterion level**.

7.2.3 ASSESSMENT

7.2.3.1 General

- Full compliance is achieved when the report demonstrates implementation of [SD.2] Socio-Cultural Interaction Checklist.
- Identify residents and stakeholders that could potentially be impacted by logistics and construction activities.
- Assess the potential impacts of the logistics and construction activities on the nearby community and stakeholders.
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed need for socio-cultural interaction.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.

7.2.3.2 Report

Prepare a Socio-Cultural Interaction Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing neighborhoods arrangement in the vicinity of the site, relevant challenges encountered by the Project, and the main strategies adopted to manage socio-cultural interaction, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Communication protocols with nearby residents and stakeholders.
- Action plan on the feedback provided by the neighboring community.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [SD.2] Socio-Cultural Interaction Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [SD.2] Socio-Cultural Interaction Checklist.

7.2.4 CRITERION LEVELS

Levels	Compliance with [SD.2] Socio-Cultural Interaction Requirements
0	Report does not demonstrate compliance.
3	Report demonstrates full compliance.

7.2.5 SUBMITTALS

- Submit the Socio-Cultural Interaction Report, which includes the narrative summarizing the status of socio-cultural interaction relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [SD.2] Socio-Cultural Interaction Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [SD.2] Socio-Cultural Interaction Checklist.

8.0 [MO] MANAGEMENT & OPERATIONS

The Management & Operations category considers aspects related to waste management, welfare facilities, construction health & safety and Workers accommodation.

IMPACTS

Environmental impacts resulting from ineffective construction site management and operations include:

- Materials Depletion,
- Land Use and Contamination,
- Human Health & Safety Risks,
- Reduced comfort and wellbeing.

MITIGATE IMPACT

Factors that could mitigate environmental impact include:

- Planning and implementing sustainable management of waste,
- Providing appropriate facilities for the welfare of workers and staff on-site,
- Ensuring health and safety of workforce by providing necessary facilities, developing plans and management systems,
- Use GSAS certified workers accommodation.

CRITERIA IN THIS CATEGORY

No.	Criterion	Level		Weight	Incentive Weight
		Min	Max		
MO.1	Waste Management	0	3	7.00%	
MO.2	Welfare Facilities	0	3	5.00%	
MO.3	Construction Health & Safety	0	3	6.00%	3.00%
MO.4	Workers Accommodation	0	3	3.00%	4.00%
Total				21.00%	7.00%

8.1 [MO.1] WASTE MANAGEMENT

8.1.1 PURPOSE

To minimize waste arising from on-site construction activities taken to landfill or incineration.

8.1.2 ASSESSMENT PRINCIPLES

The Project will **assess** the methods and measures implemented to maximize the percentage of all waste generated by construction activities diverted from landfill or incineration through:

- Reduction.
- Collection.
- Segregation.
- Storage.
- Disposal.

The Project will implement a comprehensive waste tracking system for the collection and disposal of all types of waste.

The Project will prepare waste management **reports** and complete the **calculator** for [MO.1] Waste Management to establish the **criterion level**.

8.1.3 ASSESSMENT

8.1.3.1 General

The assessment of this criterion is both prescriptive and performance based. The prescriptive part is based on the degree of compliance of the Waste Management Report, which demonstrates the implementation of the methods and measures during the construction stage.

The performance-based parameter is the percentage of waste diverted from landfill or incineration in accordance with GSAS determined thresholds.

- Assess the expected types and amount of waste arising from the construction activities and devise appropriate waste management procedures to reduce the amount of waste, reuse, recycle and eventually dispose of the waste at authorized facilities. Note: the waste existing on-site prior to the commencement of the works is also excluded from the assessment, as it is part of [M.1] Materials Diversion from Landfill criterion. Also note excavated soil is excluded from the assessment, as it is part of [M.3] Cut & Fill Optimization criterion.
- Engage an authorized waste subcontractor to collect, transport and dispose the waste.

- Implement a comprehensive tracking system for the collection and disposal of waste, including date, origin, destination, type and amount of waste. Develop the tracking system consistent with the metric unit, either cubic meter (m³) or ton (t).
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed impacts of waste associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.
- Input the data into [MO.1] Waste Management Calculator to determine the percentage of waste diverted from landfill or incineration.
- Prepare all applicable documentation to support the values entered in the calculator.

8.1.3.2 Report

Prepare a Waste Management Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of wastes on the site, relevant challenges encountered by the Project, and the main strategies adopted to manage waste generation and diversion, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Evidence of waste collection from the site including, per type of waste, all the monthly invoices issued by the waste subcontractor and at least one sample waste transfer note, and a list of the authorized disposal sites.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [MO.1] Waste Management Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [MO.1] Waste Management Checklist.

8.1.3.3 Calculator

A. Inputs

Project Information

- Complete the date of submission, project name and GSAS Project ID.

Part 1 – Waste Management Report

- Select from the drop-down menu whether the Waste Management Report is compliant or not.

Part 2 – Waste diverted from Landfill/Incinerator

- Select the waste measurement unit, either cubic meter or ton. All data entered in the calculator should be measured in the selected unit.
- Type of Waste: enter in this column the type of waste that has been generated from site.
- Quantity of Waste Sent to Landfill or Incineration: enter in this column the volume (m3) or weight (t) of the waste that has been either disposed to landfill or incinerated.
- Quantity of Waste Reused: enter in this column the volume (m3) or weight (t) of the waste that has been reused either on- or off-site.
- Quantity of Waste Recycled: enter in this column the volume (m3) or weight (t) of the waste that has been sent to a recycling facility for further reuse.
- Quantity of waste Composted: enter in this column the volume (m3) or weight (t) of the waste that has been sent to a composting facility.
- Quantity of Safely Treated and Disposed Waste: enter in this column the volume (m3) or weight (t) of hazardous waste that has been safely disposed to an authorized disposal facility.

B. Calculations

- Total Quantity of Waste Generated On-Site = sum of either the volume (m3) or weight (t) of the type of waste generated on-site.
- Total Quantities = sum of either the volume (m3) or weight (t) of the waste either:
 - taken to landfill or incineration.
 - reused.
 - recycled.
 - composted.
 - safely treated and disposed.
- Total Quantity of Waste Generated = sum of either the volume (m3) or weight (t) of all the waste.
- Total Quantity of Waste Diverted = sum of either the volume (m3) or weight (t) of the waste diverted.

- Percentage of Waste Diverted from Landfill or Incineration (X) = percentage of waste diverted from landfill/incineration to the total amount of waste generated.

8.1.4 CRITERION LEVELS

Levels	Compliance with [MO.1] Waste Management Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates compliance.
2	Report demonstrates compliance and $60\% \leq X < 80\%$
3	Report demonstrates compliance and $X \geq 80\%$

8.1.5 SUBMITTALS

- Submit the Waste Management Report, which includes the narrative summarizing the status of waste management relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [MO.1] Waste Management Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [MO.1] Waste Management Checklist.
- Submit [MO.1] Waste Management Calculator together with the supporting documentation, including:
 - At least one collection Waste Transfer Note (WTN) per type of material and month, signed by both originator and transporter.
 - At least one disposal WTN per type of material and month, signed by both transporter and disposal facility.
 - All the collection invoices or monthly logs issued by the transporter, showing the quantities per type of material.
 - All the disposal invoices or monthly logs issued by the disposal facility, showing the quantities per type of material.
 - Evidence of the reuse of the materials on-site, for example Material Approval Requests approved by the Client or photos, as applicable.
 - Photographs and videos as appropriate;
 - Any other supporting documents or evidences that demonstrate the compliance.

8.2 [MO.2] WELFARE FACILITIES

8.2.1 PURPOSE

To provide satisfactory on-site welfare facilities for employees, construction workers and visitors.

8.2.2 ASSESSMENT PRINCIPLES

The Project will assess the welfare facilities provided on the construction site and the level of satisfaction of employees and construction workers with the facilities.

The Project will prepare welfare facilities reports and complete the calculator for [MO.2] Welfare Facilities based on satisfaction survey to establish the criterion level.

8.2.3 ASSESSMENT

8.2.3.1 General

The assessment of this criterion is both prescriptive and performance based. The prescriptive part is based on the degree of compliance of the Welfare Facilities Report, which demonstrates the implementation of the methods and measures during the construction stage.

The performance-based parameter is the level of satisfaction of both employees and construction workers with the on-site welfare facilities.

- Assess the required type and size of welfare facilities with respect to the expected peak manpower, to ensure the workers welfare needs are satisfied.
- Implement on-site the methods and measures outlined in the Guidelines Manual, where applicable. Project may identify additional methods and measures for implementation based on the assessed needs for welfare facilities associated with the construction activities.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the methods and measures during the period of assessment.
- Conduct a survey among employees and construction workers to determine their level of satisfaction with the on-site welfare facilities.
- Input the survey data into [MO.2] Welfare Facilities Calculator to determine the level of satisfaction of employees and construction workers.
- Prepare all applicable documentation to support the values entered in the calculator.

8.2.3.2 Report

Prepare a Welfare Facilities Report that demonstrates the implementation of the methods and measures identified by the Project during the construction stage, which includes the following:

- Narrative describing the existing conditions of welfare facilities on the site, relevant challenges encountered by the Project, and the main strategies adopted to manage welfare facilities, in addition to guiding the GSAS certifier through the submitted documentation. The narrative can be updated based on the stage of construction as deemed necessary.
- Layout drawings showing the location of the welfare facilities on-site.
- Breakdown of the implemented methods and measures and associated tasks including supporting documents listed in [MO.2] Welfare Facilities Checklist.
- Brief on targeted activities or challenges for next stage.
- Completed [MO.2] Welfare Facilities Checklist.

8.2.3.3 Survey

Project will conduct one survey per construction stage during the peak activity, when the number of workers is expected to be the maximum.

There will be two separate questionnaires, one for employees and the other for construction workers, as they use different facilities, although some of them are common. Both questionnaires can be found in [MO.2] Welfare Facilities Calculator.

- Based on the number of employees at the peak time of the construction stage, calculate the minimum size of the survey sample using [MO.2] Welfare Facilities Calculator. Similarly, calculate the minimum size of the construction workers survey sample.
- Select the personnel who will take part in the survey. For both employees and construction workers, the sample should be representative of the whole considering the following criteria:
 - Nationality, Age, Gender, Level of Education, Employer, Trade/Position, etc.
- Conduct the survey on-site
 - Give away print outs of the questionnaire for the employees to populate. Each print out should have a reference number. The questionnaire must be anonymous, the name of the employee/construction worker should not appear in the questionnaire. Translate the questionnaire into the languages spoken by the employees and construction workers.
 - Populate one softcopy of the questionnaire per employee in [MO.2] Welfare Facilities Calculator.
 - The calculator will compute the level of satisfaction for both employees and construction workers and the overall level of satisfaction.

- Prepare all applicable documentation to support the values entered in the calculator. Although the survey questionnaire must be anonymous, employees should sign an attendance sheet as proof of their participation in the survey.

8.2.3.4 Calculator

A. Inputs

Project Information

- Complete the date of submission, project name and GSAS Project ID.

Part 1: Welfare Facilities Report

- Select from the drop-down menu whether the Welfare Facilities Report is compliant or not.

Part 2: Scale of Survey

- Number of Employees On-Site at the Time of the Survey was Conducted (Ne): enter the number of employees working on-site.
- Number of Construction Workers Employed at the time of the Survey was Conducted (Nw): enter the number of construction workers working on-site.

Part 3: Employees Questionnaire

- Every numbered column corresponds to the questionnaire with the same reference number. Enter in each cell of the column the answers to each question, select the answer from the drop-down menu among:
- Very good - Satisfactory - Poor - N/A

Part 4: Construction Workers Questionnaire

- Every numbered column corresponds to the questionnaire with the reference number. Enter in each cell of the column the answers to each question, selecting the answer from the drop-down menu among:
- Yes - No - N/A

B. Calculations

Part 2: Survey Sample Size

- Minimum number of employee questionnaires required (Q_e) = number of employee questionnaires to be completed to achieve a level of accuracy greater than 95% (standard error lower than 5%).
- Minimum number of construction workers questionnaires required (Q_w) = number of construction workers questionnaires to be completed to achieve a level of accuracy greater than 95% (standard error lower than 5%).

Note: The Project shall ensure that the scale of the survey and the number of completed surveys returned by employees and construction workers represents a true and accurate response to the questionnaire.

Part 3: Employees Questionnaire

- N.A. = number of “not applicable” answers obtained per question.
- Very good = number of “very good” answers obtained per question.
- Satisfactory = number of “satisfactory” answers obtained per question.
- Poor = number of “poor” answers obtained per question.
- Total Applicable = number of total questionnaires minus the “N.A” answers.
- Level of Satisfaction for the employees (LSe)= computed level of satisfaction of the employees based on the given answers.

Part 4: Construction Workers Questionnaire

- N.A. = number of “not applicable” answers obtained per question.
- Yes = number of “yes” answers obtained per question.
- No = number of “no” answers obtained per question.
- Total Applicable = number of total questionnaires minus the “N.A” answers.
- Level of Satisfaction for workers (LSw)= computed level of satisfaction of the construction workers based on the given answers.

Part 5: Summary

- Two charts have been introduced in the calculator for informative purposes. The level of satisfaction of both employees and construction workers on each of the questions are displayed. Project may make use of these charts to make changes to those facilities with low levels of satisfaction.

- Overall Level of Satisfaction (X) = overall level of satisfaction calculated as a weighted average of the employees and construction workers levels of satisfaction.

8.2.4 CRITERION LEVELS

Levels	Compliance with [MO.2] Welfare Facilities Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates compliance.
2	Report demonstrates compliance and $65\% \leq X < 80\%$
3	Report demonstrates compliance and $X \geq 80\%$

8.2.5 SUBMITTALS

- Submit the Welfare Facilities Report, which includes the narrative summarizing the status of welfare facilities relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures as outlined in [MO.2] Welfare Facilities Checklist. If the Project considers any of the methods and measures outlined in the GSAS-CM Guidelines Manual as not applicable to the construction site, a justification must be provided.
- Completed [MO.2] Welfare Facilities Checklist.
- Submit [MO.2] Welfare Facilities Calculator together with the supporting documentation, including:
 - Evidence of the number of employees and construction workers working on-site at the time the survey was conducted, for example HSE reports approved by the Client.
 - All the completed questionnaires.
 - Survey attendance sheet signed by the workers who participated in the survey.
 - Any other supporting documents or evidences that demonstrate the compliance.

8.3 [MO.3] CONSTRUCTION HEALTH & SAFETY

8.3.1 PURPOSE

To implement health and safety requirements for site personnel, employees and visitors throughout the construction program.

8.3.2 ASSESSMENT PRINCIPLES

The Project will **assess** the implementation of the requirements detailed in the Health and Safety Plan for the construction works.

The Project will prepare construction health and safety **reports** to establish the **criterion level**.

8.3.3 ASSESSMENT

8.3.3.1 General

- Partial compliance is achieved when the report demonstrates implementation of the Health & Safety Plan developed in-house.
- Substantial compliance is achieved when the report demonstrates implementation of a Health & Safety Plan developed in accordance with international or national standards.
- Full compliance is achieved when the Project achieves GSAS Health & Safety certification.
- Assess the logistics and construction activities and prepare a Health and Safety Plan, including a Heat Stress Monitoring Program.
- Implement on-site the Health and Safety Plan, including a Heat Stress Monitoring Program, and the methods and measures outlined in the Guidelines Manual, where applicable.
- Ensure that the Heat Stress Monitoring Program includes measuring 30-minute average heat stress in °C. Implement a system to collect and record the measurements.
- Schedule methods and measures related tasks in accordance with the project master program in view of the frequency of the GSAS Audit Advisory Notices.
- Manage environmental and operational risks associated with the implementation of the methods and measures.
- Prepare evidence documents proving the implementation of the Health and Safety Plan during the period of assessment.
- Obtain GSAS Health & Safety certification for the construction site.

8.3.3.2 Plan

Project does not need to develop a specific Health & Safety Plan for GSAS certification, only the Health and Safety Plan required by the local authorities.

Project may choose to develop the Health and Safety Plan specific for the project based on:

- Adoption of company's in-house developed Health & Safety practice and approved by the Client.
- International or national health & safety best practices standard relevant to the construction site, or
- A combination of both.

8.3.3.3 Report

Prepare a Health and Safety Report that demonstrates the implementation of the methods and measures during the construction stage, which includes the following:

- Narrative describing the implemented health and safety program and incorporating all necessary documentations for the policies, procedures and forms.
- Evidences of health and safety training to staff, workers and visitors.
- Records of Heat Stress Monitoring Program.
- Monthly Health & Safety reports approved by the Client.
- Brief on targeted activities or challenges for next stage.

8.3.4 CRITERION LEVELS

Levels	Compliance with [MO.3] Construction Health & Safety Requirements
0	Report does not demonstrate compliance.
1	Report demonstrates partial compliance.
2	Report demonstrates substantial compliance.
3	Project demonstrates full compliance.

Incentive Weights:

An incentive weight of 3.00% is allocated for GSAS audited Health & Safety certification.

8.3.5 SUBMITTALS

- Submit the Project Health & Safety Plan approved by the Client.
- Submit the Construction Health & Safety Report, which includes the narrative summarizing the status of health and safety relevant to the construction stage where applicable.
- Documents proving the implementation of each one of the methods and measures, including evidences of workers training.
- Records of Heat Stress Monitoring Program including 30-minute average heat stress in °C.
- Monthly Health & Safety reports approved by the Client.
- GSAS Health & Safety certificate where applicable.

8.4 [MO.4] WORKERS ACCOMMODATION

8.4.1 PURPOSE

To use GSAS certified Workers Accommodation scheme for the duration of the construction program.

8.4.2 ASSESSMENT PRINCIPLES

The Project will **assess** the workers accommodation using the latest applicable version of GSAS assessment manual and the requirements therein to establish the ***criterion level***.

8.4.3 ASSESSMENT

8.4.3.1 General

- Ensure that construction workers live in accommodation that has achieved GSAS certification (GSAS Design & Build or GSAS Operations).
- Obtain evidences of GSAS Workers Accommodation certificate.
- The criterion level is based on the achieved GSAS Workers Accommodation certification rating, as explained in the Criterion Levels section.

8.4.4 CRITERION LEVELS

Levels	Compliance with [MO.4] Workers Accommodation Requirements
0	Workers accommodation has obtained no GSAS certification.
1	Workers accommodation has obtained GSAS-D&B certification of 1-Star or GSAS-OP Bronze rating.
2	Workers accommodation has obtained GSAS-D&B certification of 2-Star or GSAS-OP Silver rating.
3	Workers accommodation has obtained GSAS-D&B certification of 3-Star or higher or GSAS-OP Gold rating or higher.

Incentive Weights:

An incentive weight of up to 4.00% is available subject to the certification rating achieved for GSAS certified workers accommodation.

8.4.5 SUBMITTALS

Submit GSAS-D&B certification or GSAS-OP certification for the workers accommodation.

9.0 GSAS CONSTRUCTION MANAGEMENT PLAN (GSAS-CMP)

9.1 OVERVIEW

The GSAS Construction Management Plan (GSAS-CMP) is a project specific plan developed by the Project to incorporate the targeted GSAS-CM categories and criteria and the targeted final GSAS-CM rating, to ensure human, organizational, and communication resources and procedures are prepared and capable of meeting the requirements of the construction project and GSAS-CM targets.

The scale, complexity and local environment of different projects may alter the coverage of issues and level of details required in the GSAS-CMP. However, the content of each GSAS-CMP shall include all the sections listed in the Contents section.

9.2 ASSESSMENT PRINCIPLES

The Project will prepare a construction management plan (GSAS-CMP), the content of which shall address each of the elements outlined in the GSAS-CM Guidelines Manual.

9.3 ASSESSMENT

- Define the personnel roles and responsibilities involved in the preparation of the GSAS-CMP.
- Define the targeted GSAS-CM rating.
- Define the targeted categories and criteria and anticipated criterion levels based on the characteristics and capabilities of the project. Use the GSAS-CM Scoring Sheet to consider alternative scoring scenarios.
- Define the main strategies to be implemented on-site per criterion to achieve the targeted level.
- Define the boundaries of the GSAS-CM scope.
- Propose dates for each of the three construction stages based on the construction program.
- Define an organization chart with the personnel involved in the implementation and monitoring of GSAS-CM methods and measures.
- Develop a training program to cater for the educational and awareness requirements of the targeted criteria.
- Develop a communication protocol to liaise with the different stakeholders involved in the GSAS-CM implementation.
- Develop a reporting system to monitor and assess the implementation of GSAS-CM.
- Prepare the GSAS-CMP in accordance with the GSAS-CM Guidelines Manual.

9.4 SCORING

Following the submission of the GSAS-CMP, GSAS Trust will review the plan to verify whether all elements of the plan are complete and meet all the stipulated requirements. GSAS Trust may require re-submission of the GSAS-CMP for approval where changes based on periodic reviews introduce new potential environmental impacts, alter the frequency or consequences of existing impacts or result in a significant environmental impact pertaining to targeted criteria.

Levels	Compliance with GSAS-CMP Requirements
Pre-requisite met	GSAS-CMP demonstrates compliance.
GSAS Certification Denied	GSAS-CMP does not demonstrate compliance.

9.5 SUBMITTALS

Submit the GSAS-CMP including the proposed contents for the plan. In addition, provide the supporting documentation to complete the GSAS-CMP requirements.



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