Caribbean Efficient and Green-Energy Buildings Project

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Task 5

T.A. Marryshow Community College

Grenada - September 2025

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Content

1. Site Description and Scope of Works

1.1. Subproject Scope

This Environmental and Social Management Plan (ESMP) has been developed under the Caribbean Efficient and Green-Energy Buildings Project (CEGEB) supported by the World Bank, under the responsibility of the Organization of Eastern Caribbean States (OECS) at the regional level, and the Grenada's Ministry of Climate Resilience, the Environment and Renewable Energy (MCRERE) at the national level.

The ESMP document aligns with the requirements of the CEGEB Environmental and Social Management Framework -ESMF (March 2025 Draft)-. It aims to ensure that energy efficiency and renewable energy improvements are implemented sustainably, minimizing potential adverse impacts while enhancing positive outcomes.

T.A. Marryshow Community College (TAMCC) is a leading national public tertiary-level institution in Grenada, offering academic, technical, and vocational education and training across the tri-island state of Grenada, Carriacou, and Petite Martinique. Formally established in 2001 under the T.A. Marryshow Community College Act of 1995, TAMCC resulted from the amalgamation of several national training institutions, including the Grenada Teachers' College, the Mirabeau Agricultural School, and technical divisions of the Ministry of Education. It provides accessible, state-subsidised education to a wide student base and plays a key role in supporting national development through workforce training and academic programmes.

The main campus is located in Tanteen, in the parish of Saint George's, within the capital city. The site includes a cluster of buildings spread across gently sloping terrain, surrounded by sporting and government facilities, including the National Stadium. TAMCC also operates additional satellite centres, such as the Mirabeau campus for agriculture in St. Andrew, the Carriacou campus at Six Roads, and a multipurpose facility in La Fortune, St. Patrick. These locations expand the college's reach to rural communities and support the government's commitment to education access throughout the country.

The college is structured into three main schools: the School of Arts, Sciences and Professional Studies (SASPS), the School of Applied Arts and Technology (SAAT), and the School of Continuing Education (SCE). Together, they offer associate degrees, technical diplomas, certificates, and short courses in diverse disciplines ranging from hospitality and business to education and natural sciences. In addition to classroom instruction, many programmes incorporate work-based learning, including internships and community-based projects, thereby enhancing the practical and employability skills of graduates. While TAMCC is the principal local provider of public tertiary education, other higher education institutions, such as the internationally operated St. George's University, also operate in the country, focusing primarily on medical and health sciences.

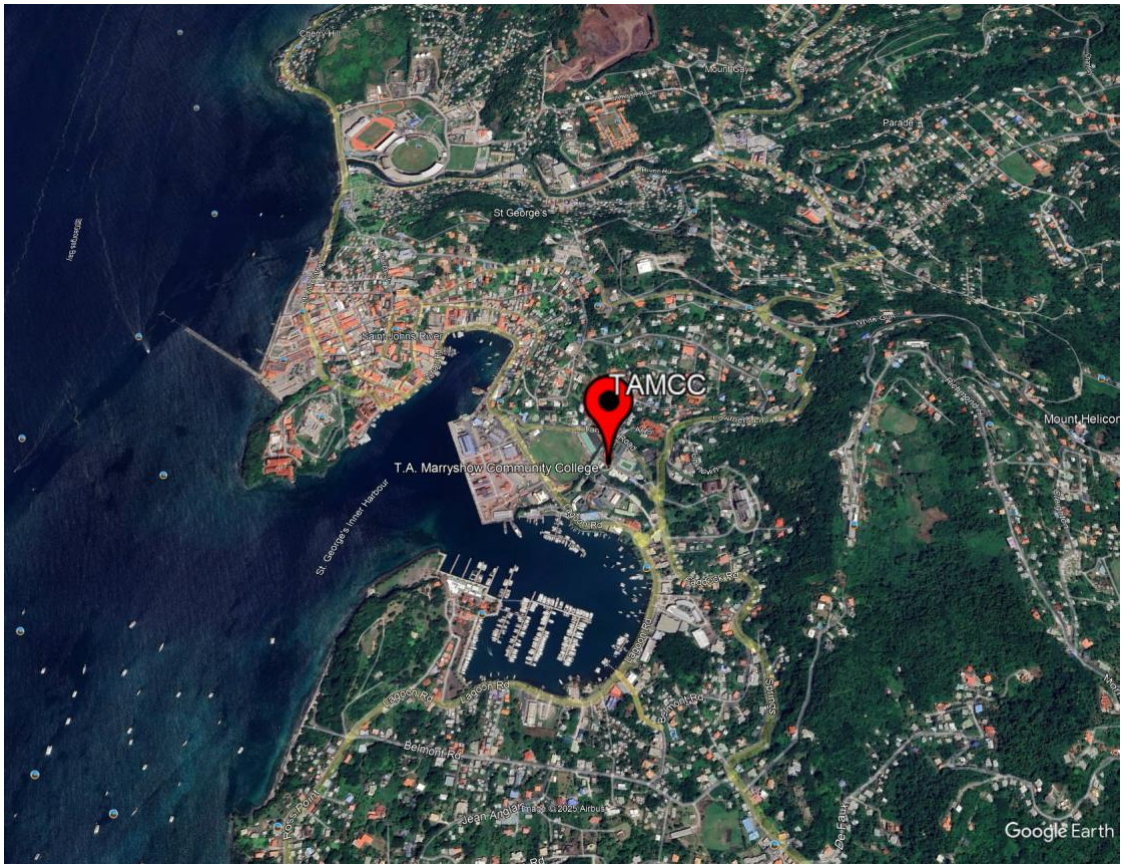

Figure 1.1 - Location of T.A. Marryshow Community College

Figure 1.2 - Aerial view of the TAMCC campus buildings

Implementation of the CEGEB Project at T.A. Marryshow Community College (TAMCC) will yield a range of positive outcomes, building upon the institution's existing initiatives to incorporate sustainable energy solutions. Several campus buildings are already equipped with solar photovoltaic panels, and the project will further strengthen this foundation through enhanced

energy efficiency measures and additional renewable energy capacity. Anticipated benefits include:

- Reduced energy consumption, leading to lower operational costs, decreased greenhouse gas emissions.
- Increased generation of clean, renewable energy by upgrading and expanding the existing solar photovoltaic infrastructure, supporting Grenada's national objectives for energy independence and climate resilience, while also providing practical learning opportunities for students enrolled in technical and applied science programmes.
- Improved indoor environmental conditions for students, lecturers, and administrative staff, through upgraded ventilation, temperature regulation, and air filtration systems, thereby contributing to a healthier and more conducive academic environment.
- Enhanced environmental education and awareness, with the campus serving as a living laboratory showcasing sustainable technologies and energy-efficient building design, promoting environmental responsibility among students and the wider community.
- Local employment generation and skills development, through the engagement of contractors, engineers, and technicians in the deployment of clean energy technologies and environmentally responsible construction methods, with scope for student exposure to emerging green career pathways.

1.2. Geographic Conditions

The State of Grenada is located in the south-eastern Caribbean Sea and forms part of the Windward Islands in the Lesser Antilles. It comprises three main islands: Grenada, the largest and most populous; Carriacou, located approximately 32 kilometres to the north-east; and Petite Martinique, a small island situated just east of Carriacou. While Grenada serves as the administrative, economic, and infrastructural centre of the country, Carriacou and Petite Martinique are more rural in character and maintain strong cultural and economic ties to traditional livelihoods such as fishing, boat building, and small-scale agriculture.

Grenada is a volcanic island. Its topography is shaped by a north–south ridge of mountains, with steeper slopes on the western side and a more gradual incline towards the east and south-east. The highest point is Mount Saint Catherine, which rises to 840 metres above sea level. The terrain is rugged, characterised by steep-sided valleys and a landscape that is both ecologically rich and visually striking. Numerous rivers and streams originate in the central highlands, providing freshwater resources that are essential for domestic use, agriculture, and biodiversity conservation. The soils, derived from volcanic parent materials, are generally fertile but prone to erosion, particularly in areas with steep gradients or insufficient vegetation cover.

Grenada's forested areas are of high environmental value. Nearly half of the country's total land area is covered by forests—approximately 10,000 acres (4,000 hectares). These forests fulfil

multiple functions, including the production of timber, the provision of wildlife habitat, and the maintenance of essential ecosystem services such as watershed protection and carbon sequestration. Moreover, Grenada's forests significantly contribute to the country's tourism sector, offering a pristine and biodiverse landscape that supports eco-tourism and enhances the national economy.

The country experiences a tropical maritime climate, with warm temperatures year-round, high humidity, and a pronounced wet season. Rainfall is heaviest from June to November, coinciding with the Atlantic hurricane season. Annual precipitation varies significantly with elevation, ranging from approximately 1,500 millimetres in lowland coastal areas to over 3,800 millimetres in upland zones. Grenada is highly vulnerable to natural hazards, particularly hurricanes, tropical storms, landslides, and flooding.

Saint George's, where TAMCC is located, lies on the south-western coast of the island. The area is defined by rugged topography, with steep hills descending toward a natural horseshoe-shaped harbour known as The Carenage, regarded as one of the most scenic ports in the Caribbean. The urban layout is compact, with narrow, winding streets that follow the contours of the terrain, presenting challenges for traffic flow, infrastructure expansion, and accessibility. Due to its coastal location and steep topography, Saint George's is particularly vulnerable to climate-related hazards, including coastal flooding, tropical storms, and landslides.

1.3. Social and Institutional Conditions

According to the preliminary results of the 2021 Population and Housing Census conducted by the Central Statistical Office, the total population of the State of Grenada, comprising the main island of Grenada and the smaller islands of Carriacou and Petite Martinique, stands at 109,021. This represents a 2.2% increase from the 106,669 recorded in the 2011 Census.

The Parish of Saint George, situated on the southwestern coast of Grenada, is the country's most populous and densely populated administrative division, with approximately 44,777 inhabitants—around 41% of the national total. It encompasses the capital city of St. George's and serves as Grenada's primary administrative, commercial, and institutional hub. The parish hosts the national Parliament, key government ministries, the main public hospital, and a wide range of essential public services. It also functions as an educational centre, home to several notable institutions including T.A. Marryshow Community College (TAMCC), the Grenada Boys' Secondary School, and St. George's University near Point Salines.

TAMCC, located in the capital parish, plays a strategic role in Grenada's human capital development by training professionals in fields such as hospitality, public service, and environmental management. Its participation in the CEGEB Project reinforces its position as a national reference for sustainable infrastructure and green skills development.

Over the past few decades, Grenada's economy has experienced a structural transformation, shifting from a predominantly agriculture-based model to one increasingly driven by the services sector. Tourism now accounts for the largest share of gross domestic product (GDP), supported by government efforts to promote the country as a clean, safe, and unspoilt destination through strategic investments and international marketing campaigns. This evolution has heightened the importance of environmental protection and the development of sustainable infrastructure, particularly in public buildings that reflect national identity and support essential services.

In addition to its administrative and institutional significance, Saint George's plays a central role in the national economy, particularly in the tourism and services sectors. The urban core of the parish features hotels, restaurants, marinas, retail centres, and public markets, and sustains a high level of daily activity from both residents and international visitors.

1.4. Utility Services and Public Infrastructure

Water Supply and Sewerage System

At the national level, water supply and sewerage services in Grenada are managed by the National Water and Sewerage Authority (NAWASA), which is responsible for the sourcing, treatment, and distribution of potable water, as well as the oversight of sewerage systems, particularly in urban and semi-urban areas. Most of the national water supply is drawn from surface sources such as rivers and springs originating in the island's central highlands. In line with other institutions located in Saint George's, TAMCC is connected to the public water supply and has access to basic sanitation infrastructure.

Electricity

Electricity generation, transmission, and distribution in Grenada are managed by the Grenada Electricity Services Ltd. (GRENLEC). The national grid is primarily powered by imported diesel fuel, although efforts to incorporate renewable energy—particularly solar photovoltaic systems—are progressively expanding. Electricity supply in Saint George's is supported by GRENLEC's central substation infrastructure.

TAMCC is connected to the national grid and has relatively high electricity demand due to its extensive campus, which includes multiple academic buildings, laboratories, administrative offices, and specialised training facilities. Several of these buildings are already equipped with rooftop solar panels, providing a supplementary source of clean energy. Further energy efficiency improvements are key to reducing operational costs, lowering emissions, and strengthening TAMCC's role as a model for sustainable public education infrastructure.

Waste Management

Waste management in Grenada is overseen by the Grenada Solid Waste Management Authority (GSWMA), the statutory agency mandated to coordinate the collection, transport, treatment, and final disposal of solid waste throughout the tri-island state of Grenada, Carriacou, and Petite Martinique. A waste collection schedule is in place nationwide, with frequencies ranging from two to seven times per week, depending on population density and waste generation rates. This system covers both residential and institutional zones, including public buildings such as schools, hospitals, and government offices.

TAMCC, as the country's principal public tertiary institution, generates a wide range of waste types typical of an academic environment, including office waste, food waste, packaging materials, and laboratory residues. As such, effective waste handling practices are essential for maintaining campus cleanliness, ensuring health and safety, and promoting environmental responsibility among students and staff.

The island's only official disposal facility is the Perseverance Landfill, located in Saint George, which also functions as the operational hub for several waste diversion initiatives. GSWMA has implemented systems at this site for metal baling, fluorescent bulb crushing, and wood chipping, and collaborates with private actors such as Spice Isle Recycling, Ecocell, and Southern Waste Management Services to expand recycling and recovery services. Grenada is a party to the Basel Convention and permits the export of hazardous and classified waste under international provisions, in accordance with national regulations and procedures.

Grenada is a party to the Basel Convention and permits the export of hazardous and classified wastes under its provisions, in line with international environmental and safety protocols. Exports must follow national regulations and include prior informed consent, appropriate labelling and packaging, and full traceability through transport documentation. An example of waste exports relevant to the CEGEB project refers to the shipment and recycling off island of mercury, that is safely collected in the process of bulb crushing and stored in special containers. This process is carried out at the Hazardous Waste Treatment Plant at Perseverance landfill. Similarly, a metal baling process is carried out for metal waste, which is compacted, processed, and subsequently shipped off island for recycling purposes.

Ongoing national challenges related to waste segregation, institutional engagement, and public awareness highlight the value of integrating sustainable waste management practices into public infrastructure, particularly in educational settings where such practices also serve an important demonstrative and educational function.

Transportation and accessibility

Saint George's is connected to the rest of the island via a network of paved roads, with public transportation primarily provided by privately operated minibuses. TAMCC is directly accessible

via Tanteen Road, which connects to other major routes serving the capital. The college is situated near other public institutions and recreational areas.

Its location within the capital parish ensures good accessibility for students, staff, and visitors travelling from different parts of the island. The campus includes pedestrian access points and informal parking areas, although circulation and parking availability may occasionally be affected during peak academic periods or due to general urban traffic patterns. Continued attention to traffic management and access coordination supports safe and efficient mobility in and around the institution.

Communications

Grenada has a well-developed telecommunications sector, with several service providers offering mobile, fixed line, and broadband internet services. T.A. Marryshow Community College (TAMCC) is equipped with institutional broadband internet and internal communications infrastructure that supports administrative operations, academic delivery, digital learning platforms, and communication among staff and students. As the country's main public tertiary institution, with a principal campus in Tanteen and additional satellite sites in St. Andrew, St. Patrick, and Carriacou, reliable connectivity is essential for ensuring coordination and access to educational resources across all locations.

Emergency services

Emergency services in Grenada are centrally coordinated and available in the Saint George's area through the Royal Grenada Police Force, which includes the Fire and Rescue Services and emergency medical response teams. The General Hospital, located nearby, provides primary and secondary health care services as well as emergency medical care. Fire stations and police headquarters are also situated within Saint George's. Given TAMCC's status as a national tertiary institution with a large and diverse population of students, faculty, and administrative staff, coordinated emergency planning is essential to ensure the campus is equipped with appropriate fire detection and suppression systems, clearly marked evacuation routes, and unobstructed access for emergency responders.

1.5. Cultural and Historic Sensitivity

Grenada possesses a rich and diverse cultural heritage shaped by its Indigenous Kalinago past, African ancestry, European colonial history, and Caribbean identity. This heritage is reflected in its architecture, oral traditions, festivals, religious practices, and historical sites. Many of the island's urban and rural areas, particularly within Saint George's, contain buildings and features of cultural, historical, and architectural significance. The historic town of Saint George's itself, with its colonial-era forts, churches, and the Carenage harbour, is recognized for its cultural value and scenic character.

The principal authority responsible for the protection, preservation, and promotion of Grenada's tangible and intangible cultural heritage is the Grenada National Trust, established under the National Trust Act. The Trust identifies and conserves sites and structures of historical or architectural interest and works in collaboration with the Ministry of Culture and other agencies to raise public awareness, manage restoration programs, and maintain heritage registers. Additional institutional frameworks, such as the National Heritage Protection Act and the Physical Planning and Development Control Act, include provisions for the safeguarding of culturally significant buildings and landscapes, particularly in cases of infrastructure development or land-use change.

TAMCC is not a formally designated heritage site and does not retain historic architectural elements in its current campus infrastructure. However, the institution holds substantial cultural and educational significance in Grenada. Formally established in 2001 through the consolidation of several older training institutions—some dating back to the mid-20th century—TAMCC has played a central role in national development by expanding access to tertiary education and technical training. Its contribution to workforce development and its legacy as the country's principal public college underscore its importance within Grenada's modern educational and institutional landscape.

2. Legal and Administrative Framework

Grenada has a legal and institutional framework to support energy transition, environmental management, and social safeguards, aligned with the objectives of the CEGEB Project. Relevant instruments include:

Energy Policy and Regulatory Framework

- Electricity Supply Act (2016, Act No. 19): Establishes Grenada's legal framework for electricity sector liberalization. Promotes renewable energy development and efficient electricity generation. Amended in 2017 (Act No. 33) to expand the mandate for energy efficiency and require procurement procedures for new generation licenses.
- National Energy Policy (2011; updated 2022–2035): Provides Grenada's long-term energy vision. The 2022 update emphasizes achieving a sustainable, affordable, resilient, and secure energy system while moving toward full decarbonization. It highlights the need for a dedicated Energy Efficiency and Conservation Act and supports market-based mechanisms for energy efficiency.
- Public Utilities Regulatory Commission (PURC) Acts (2016, 2017): Create the PURC and outline its regulatory role, including licensing, consumer complaint procedures, and tariff oversight. PURC plays a central role in regulating the electricity sector, especially for renewable energy and consumer protections.
- Grenada Vision 2030 (2012): Includes a target of 100% renewable electricity and transport by 2030, focusing on utility-scale solar development.

Environmental Protection and Planning

- Environmental Management Act (2005): Creates the legal basis for environmental governance, including pollution control, environmental permits, and the protection of natural resources.

Land Use and Conservation

- Physical Planning and Development Control Act (2016, Act No. 23; amended 2017): Governs land development and construction activities in Grenada. It establishes the Planning and Development Authority under the Ministry of Climate Resilience, the Environment and Renewable Energy (MCRERE) and empowers it to oversee development control, review applications, and require environmental and social assessments, including Environmental Impact Assessments (EIAs) for projects with potential significant impacts.

Waste Management

- Grenada Solid Waste Management Authority Act (1995): Establishes the GSWMA to manage solid waste across the tri-island state. While not directly energy-related, proper waste handling is referenced in Grenada's Nationally Determined Contributions as a GHG mitigation sector alongside energy and forestry.

Social Protection and Labour Laws

- Labour Code of Grenada: Provides the legal framework for labour relations, workers' rights, occupational health and safety, and social protections in the workplace.

Disaster Risk and Climate Resilience

- Disaster Management Act (2016): Defines disaster risk reduction and response measures under the National Disaster Management Agency (NaDMA). Key to ensuring infrastructure, including energy systems, are climate resilient.

Climate Change

- National Climate Change Policy (2007): Integrated climate change into all national development sectors, forming the foundation for subsequent instruments like the NAP and NDCs.
- National Adaptation Plan (NAP): Grenada's National Adaptation Plan 2017–2021 was developed as the country's principal instrument for climate change adaptation under the UNFCCC framework, providing strategic guidance for building national resilience. Designed as a "living document," it allows for periodic updates. As of 2024, the government has initiated a revision process to establish a new planning cycle. Progress has been made through stakeholder consultations, technical assessments, and the continued implementation of sector-specific adaptation measures. The plan outlines strategies for key sectors, including energy, water, and infrastructure. In the energy sector, actions focus on promoting energy efficiency and renewable energy as means to enhance resilience.
- Nationally Determined Contribution (NDC): Grenada's Second NDC, submitted in 2020 to the United Nations Framework Convention on Climate Change (UNFCCC), reaffirms the national commitment to reducing greenhouse gas emissions by 40% by 2030 compared to 2010 levels, conditional upon international financial and technical support. It adopts a cross-sectoral, integrated approach, targeting key areas such as energy (including transport), waste, forestry, and industrial processes, while also recognising the mitigation co-benefits of adaptation measures. Although a third NDC has not yet been formally submitted, Grenada is actively engaged in the preparatory processes to update its climate commitments.

2.1. Environmental Permits and Documentation

Under Section 22 of the Physical Planning and Development Control Act No. 23 of 2016, the Planning and Development Authority may require an Environmental Impact Assessment for any development that could significantly affect the environment. An EIA is mandatory for projects listed in the Third Schedule, unless the Authority grants an exemption for justified reasons, and no development approval can be issued without first reviewing and considering the EIA report.

The Draft Environmental Impact Assessment (EIA) Administrative Manual (2022), issued by the Ministry of Climate Resilience, Environment and Renewable Energy (MCRERE), provides detailed guidance on the administrative procedures to be followed for conducting the EIA process in Grenada.

According to Appendix 15 of the Act (Schedule III), which specifies the types of activities that normally require an EIA, it is anticipated that the procedure will not be required for the CEGEB subproject, as the planned works are limited in scope and will be carried out entirely within existing buildings. However, the Contractor should consult the MCRERE, through the Planning and Development Authority (PDA), to obtain confirmation and complete any required screening forms prior to commencing the works.

For managing any hazardous or special wastes generated, such as refrigerants, mercury-containing lamps, or electronic components, the Contractor shall notify the Grenada Solid Waste Management Authority (GSWMA). All handling, storage, and disposal activities must comply with the relevant procedures defined by the authority.

Approvals must be obtained from the Royal Grenada Police Force-Traffic Department to coordinate detours and ensure public safety, in case project works cause road closures, restricted access, or diversions near the College.

Securing required approvals is estimated to take approximately two to four weeks, depending on the completeness of the submissions and previous institutional arrangements.

3. Risk Assessment and Mitigation

3.1. Environmental, Health and Safety Guidelines

Project implementation shall align with World Bank Environmental, Health, and Safety Guidelines, as indicated in table below.

Environmental, Health and Safety Guidelines		
EHS Guideline	**Applicability**	**Observations**
Environmental		
Air Emissions and Ambient Air Quality	Applicable	Due to dust and minor exhaust emissions during construction (e.g. from drilling, machinery, or vehicles), especially relevant within an active college environment.
Energy Conservation	Applicable	Core project goal is to improve energy efficiency and the use of renewable energy sources.
Wastewater and Ambient Water Quality	Limited applicability	Wastewater may result from cleaning activities, use of sanitary facilities, and stormwater runoff during construction.
Water Conservation	Limited applicability	Water-saving fixtures and practices are encouraged in building retrofits.
Hazardous Materials Management	Applicable	Refrigerants, mercury lamps and other potentially hazardous materials must be safely handled.
Waste Management	Applicable	Non-hazardous and hazardous waste will be generated during retrofits and panel installation.
Noise	Applicable	Noise generated during construction activities may temporarily interfere with academic functions and campus operations, particularly in classrooms, offices, and shared facilities.
Contaminated Land	Limited applicability	No prior contamination is anticipated. However, any leaks, spills or runoff should be contained and managed immediately to prevent localised impact.
Occupational Health and Safety		
General Facility Design and Operation	Applicable	Project activities must follow safe design principles, especially electrical and structural changes.
Communication and Training	Applicable	Workers must be trained on safety, equipment use, and emergency procedures.
Physical Hazards	Applicable	Common construction risks: slips, trips, falls, working at heights, electrical.
Chemical Hazards	Applicable	Exposure risks from paints, sealants, refrigerants, cleaning agents.

Biological Hazards	Limited applicability	Mold has been identified in some areas of the TAMCC campus. These conditions may pose health risks and should be monitored during implementation, with safe remediation measures applied where necessary.
Radiological Hazards	Not applicable	No radiological sources have been identified.
Personal Protective Equipment (PPE)	Applicable	Required for all on-site workers.
Special Hazard Environments	Not applicable	The project does not involve special hazard environments.
Monitoring	Applicable	Environmental and Health and Safety indicators must be systematically tracked.
Community Health and Safety		
Water Quality and Availability	Limited applicability	May apply in the event of leaks, spills or improper disposal of construction-related water. No direct impact on community supply expected.
Structural Safety of Project Infrastructure	Applicable	Relevant for rooftop interventions such as solar panel installation. Structural integrity must be ensured.
Life and Fire Safety	Applicable	Essential to comply with fire codes and design standards post-retrofit.
Traffic Safety	Applicable	This is especially relevant in the context of a college environment such as TAMCC, where construction activities occur in proximity to students, staff, and regular pedestrian movement. Particular attention must be given to urban delivery zones and pedestrian safety during works.
Transport of Hazardous Materials	Applicable	Refrigerants and other potentially hazardous material must be transported following safety protocols.
Disease Prevention	Applicable	Relevant in case vector control or sanitation is required during construction.
Emergency Preparedness and Response	Applicable	Emergency routes, fire exits and evacuation protocols must remain operational and visible throughout construction works.
Construction & Decommissioning		
Environment	Applicable	Dust, noise, waste, stormwater management and spill prevention measures are required during the works.
Occupational Health & Safety (Construction)	Applicable	All health and safety standards for construction works must be observed and enforced.
Community Health & Safety (Construction)	Applicable	Relevant given the urban setting of the college. Access control, nuisance minimisation (dust, noise), and pedestrian safety must be addressed proactively.

Table 3.1 - World Bank Environmental, Health, and Safety Guidelines relevant to CEGEB implementation at TAMCC.

3.2. World Bank Environmental and Social Standards

The World Bank Environmental and Social Standards (ESSs) provide the overarching framework to identify, assess, and manage environmental and social risks and impacts associated with project activities financed by the World Bank. Their application ensures that project interventions are designed and implemented in a manner that promotes sustainability, protects people and the environment, and supports inclusive stakeholder engagement.

For the CEGEB project, eight Environmental and Social Standards (ESSs) are applicable: ESS1 through ESS6, ESS8, and ESS10. These cover areas such as environmental and social risk management, labour and working conditions, pollution prevention, community health and safety, biodiversity, cultural heritage, and stakeholder engagement.

The following section presents the environmental and social screening undertaken for the TAMCC subproject, which documents the applicability of these ESSs.

3.3. Environmental and Social Screening

The following table indicates the World Bank Environmental and Social Standards (ESSs) that must be considered for the CEGEB subproject involving retrofitting and renewable energy installations at TAMCC:

Environmental and Social Screening			
Question	**Yes**	**No**	**Comments / Required Actions**
ESS1 - Assessment and Management of Environmental and Social Risks and Impacts			
Is the subproject likely to have significant adverse environmental impacts that are sensitive and unprecedented that trigger the 'Ineligible Activities' and exclusion?		X	The activities are limited in scope and do not entail operations with significant environmental sensitivity.
Does the subproject involve renovation or rehabilitation/upgrading of any small-scale infrastructure, such as windows, doors, ceilings, or shelters?	X		The subproject may involve dismantling of outdated lighting and air conditioning systems, and other minor works that do not compromise the building's structural integrity. Photovoltaic panels shall be installed in rooftops that meet the required structural conditions.
Is the site close to a water body?	X		TAMCC is situated near St George's Harbour. However, the proposed construction works are not expected to have any impact on the coastal zone.
Will the subproject require clearing of vegetation?		X	The subproject is confined to the existing built-up areas within the TAMCC campus, and no vegetation clearance is anticipated.

Will the subproject be close to terrestrial/marine protected areas or sensitive area?	X		TAMCC is not located near any designated terrestrial or marine protected areas.
Will the subproject lead to sedimentation or soil erosion?		X	Works are within a paved and urbanised college compound with no earthmoving or slope alteration.
ESS2 - Labour and Working Conditions			
Does the subproject involve use of goods and equipment involving forced labour, child labour, or other harmful or exploitative forms of labour?		X	The project will adhere to national and international labour standards and will be contractually monitored.
Does the subproject involve recruitment of workforce including direct, contracted, primary supply, and/or community workers?	X		The subproject will involve recruitment of direct, contracted, and primary supply workers.
Do workers need PPE relative to the potential risks and hazards associated with their work?	X		PPE must be required for all tasks, following national and international regulations.
Is there a risk that women may be underpaid when compared to men when working on the project construction?		X	There is no inherent risk that women will be underpaid compared to men for performing equal work within the project. All contractors and subcontractors must comply with national labour legislation and international labour standards, including those relating to gender equality and non-discrimination in employment.
Does the project lead to any risks and impacts on individuals or groups who, because of their circumstances, may be disadvantaged or vulnerable.		X	The site is a government facility with no known impact on vulnerable populations.
ESS3 - Resource Efficiency and Pollution Prevention and Management			
Is the project likely to generate solid or liquid waste that could adversely impact soils, vegetation, rivers, streams, or groundwater?	X		Efficient use of materials must be ensured, and a detailed solid and liquid waste management plan must be implemented by contactors.
Do any of the construction works involve the removal of asbestos or other hazardous materials related to construction works?	X		No asbestos was identified during the building assessments. Other hazardous materials (such as refrigerants and mercury-containing lamps) may require proper handling during retrofitting activities
Are works likely to cause negative impacts to air and/or water quality?	X		Potential impacts to air and water quality are expected to be minor and can be effectively mitigated with appropriate measures.

Does the activity rely on existing infrastructure that is inadequate to prevent environmental impacts?		X	The subproject is designed to align with existing building infrastructure considered functional and sufficient to support planned interventions without causing adverse impacts.
Does the activity require civil works to support project activities?	X		Minor civil works will be carried out.
Does the activity require the use of pesticides, mildewcides or other chemicals?	X		The project does not directly involve the use of pesticides, mildewcides, or other chemicals as part of its core scope. However, the presence of mold and termites has been identified during assessment of campus buildings. This may potentially interfere with the safe implementation of subproject activities.
Is there a potential that the works will involve sites that are affected by issues related to mold?	X		Some areas of the TAMCC campus have been affected by moisture-related issues, including dampness, water infiltration, and mold growth. These conditions are associated with factors such as inadequate roof drainage, condensation, and insufficient ventilation in certain campus buildings. Although temporary measures have been implemented in some locations, the root causes remain unresolved.
Could the construction activities be a nuisance to other activities at the site, such as from dust, noise, construction vehicles etc.?	X		Construction works could cause temporary disruptions to college activities, particularly due to dust, noise, vibrations, and the movement of workers and construction vehicles.
ESS4 - Community Health and Safety			
Is an influx of workers, from outside the community, expected?		X	The workforce is anticipated to be drawn from the local area, and no significant influx of external workers is foreseen.
Could the construction activities be a nuisance to community members, such as dust, noise, traffic etc.?	X		Measures must be implemented to mitigate risks from construction activities, traffic, and noise in campus surroundings.
Could the construction activities disrupt the primary use of the site?	X		The construction works could disrupt the primary functions of TAMCC, particularly during class sessions, examinations, or campus events.
ESS5 - Land Acquisition, Restrictions on Land Use and Involuntary Resettlement			
Does the subproject involve involuntary land acquisition?		X	Not applicable.
Does the subproject involve physical and/or economic displacement of people?		X	Not applicable.

ESS6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources			
Do project activities alter or cause destruction to critical or sensitive natural habitats?		X	Not applicable.
ESS8 - Cultural Heritage			
Will the subproject involve any civil works that could involve demolition, renovations, or refurbishment to a historical or archaeological or culturally significant site or facility?		X	Not applicable.

Table 3.2 - World Bank Environmental and Social Standards (ESSs) relevant to CEGEB implementation at TAMCC

In addition, ESS10 –Stakeholder Engagement and Information Disclosure– is applicable. Meaningful and inclusive stakeholder engagement, along with ongoing, transparent information disclosure, is essential due to the involvement of public institutions and the integration with the surrounding urban and community context.

3.4. Environmental and Social Risks

Environmental and social risks have been identified and must be properly managed to ensure that the implementation of subprojects is conducted in a safe, compliant, and sustainable manner. The probability and severity of the main risks and impacts associated with the subproject, as well as the description of risks, are shown in the tables below.

Risk	Probability of risk	Severity of risk			
		Low	Moderate	Substantial	High
Waste generation	High		X		
Air pollution and noise	Moderate		X		
Water and soil pollution	Low	X			
Worker health & safety	Moderate		X		
In-campus community health & safety	Moderate		X		
College operation disturbance	Substantial		X		
Public safety	Low	X			
Community disturbance	Low	X			
Weather-related risks	Moderate		X		
Participation and transparency risks	Moderate	X			

Table 3.3 - Probability and severity of the main risks and impacts relevant to TAMCC subproject.

Environmental and Social Risks	
E & S Aspect	**Risks**
Waste generation	Mixed disposal of hazardous and non-hazardous waste can result in contamination, regulatory violations, and increased disposal costs. Lack of on-site segregation (e.g., metals, cardboard, electronic components) may reduce recyclability and overload landfill systems. Components such as fluorescent tubes, ballasts, circuit boards, inverters, and wiring may contain lead, mercury, cadmium, and other toxic substances. Improper handling or disposal of e-waste can lead to soil and groundwater contamination or occupational exposure for workers. Fluorinated gases from the HVAC components may imply high global warming potential. Demolition debris, wood, plastic wraps, and foam packaging from delivered equipment may become wind-blown litter or block storm drains. Inadequate removal or cleanup of these materials can create trip hazards and visual pollution. Leftover adhesives, sealants, solvents, and cleaning agents can pollute the environment if not stored or disposed of correctly. Some materials may be classified as hazardous waste under national or international standards, requiring special permits and treatment.
Air pollution and noise	Activities such as drilling, cutting, or equipment installation may generate airborne dust, which could compromise air quality and infiltrate indoor spaces, potentially affecting the health and comfort of students and college staff. Spores may be released in case mold issues are detected during works. Use of machinery and hand tools may result in high temporary noise levels.
Water and soil pollution	While unlikely, minor leaks of fuel, oils, or chemicals from machinery or stored materials may potentially contaminate soil or local drainage systems.
Worker health & safety	Fall hazards for workers operating at heights in the absence of proper protective systems. Heat-related stress (e.g., dehydration, fatigue, heat exhaustion) for workers performing outdoor tasks under high temperatures and humidity. Risk of contact with pests (rodents, insects, termites) during indoor or outdoor interventions. Exposure to spores if hidden moisture is uncovered during works. Electric shock or arc flash risks may arise during disconnection of electrical systems or modification of electrical panels, particularly if lockout/tagout procedures are not followed.

	Injury from tools, ladders, or machinery if personal protective equipment (PPE) and safety protocols are not enforced.
In-campus community health & safety	Discomfort or health concerns may arise due to dust, noise, and vibrations generated during construction activities, particularly in areas occupied by students, teaching staff, and administrative personnel during class hours and regular campus operations. Restricted access to essential facilities such as restrooms, classrooms, stairwells, or assembly areas. Exposure to spores released during works in areas affected by mold. Interference with internal circulation, including congestion or confusion in corridors or entryways, due to temporary blockages or simultaneous movement of students, staff, and workers. Accidental exposure to tools, debris, or chemical substances (e.g., adhesives, sealants, cleaning agents) left unattended in shared or circulation areas, if work zones are not properly segregated or maintained.
College operation disturbance	Temporary interruptions to access routes or essential services within the college premises—such as blocked corridors, restricted classroom access, or temporary disconnection of utilities—may disrupt academic activities and affect the comfort and functionality of spaces used by students and staff. Disruption of teaching and learning activities, such as interruptions to classes, examinations, or college assemblies. Parking availability for staff and visitors may also be temporarily reduced during construction. Limited availability of space for the temporary storage of materials, equipment, or waste may interfere with normal college operations.
Public safety	Minor risk of trips, falls, or falling objects in the vicinity of construction areas if safety measures are not properly implemented.
Community disturbance	Noise, dust, and perceived safety concerns may lead to college community dissatisfaction or formal complaints, particularly if mitigation and engagement measures are inadequate. Disruption to vehicle and pedestrian circulation, including parking and access restrictions, especially during material deliveries or waste removal.
Weather-related risks	Tropical storms or heavy rainfall events may damage partially installed systems, such as solar panels, lighting, or air conditioning units, and displace construction materials or scaffolding if not secured properly. Frequent weather changes may disrupt construction schedules and access.
Participation and transparency risks	The potential exclusion from project activities of interested parties – such as social and environmental organisations, community representatives, college staff, students, parents or guardians – may lead to reduced transparency, diminished public trust, and missed opportunities to incorporate valuable local knowledge and perspectives.

Table 3.4 – Environmental and social risks relevant to CEGEB implementation at TAMCC

After an integrated assessment of the risks and impacts associated with the subproject at TAMCC, the site has been classified as Moderate Risk based on the following considerations:

- The potential risks and impacts on human populations and/or the environment are not expected to be substantial or highly significant.
- Most identified risks and impacts are anticipated to be temporary and/or reversible in nature.
- The subproject's impacts are expected to be compensated or mitigated through defined measures.

The risk of Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) is not anticipated, as it falls under the provisions of labour regulations. However, it should be explicitly addressed in the workers' Code of Conduct, together with other key labour standards.

Waste generation warrants particular attention during the construction phase. The table below provides an overview of the types of waste likely to be generated due to subproject implementation and the associated potential risks.

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Waste type	Risk	Possible waste material
Construction and Demolition Waste	Non-Hazardous	Concrete, masonry, and brick debris from minor structural adjustments or reinforcements. Wood offcuts and discarded pallets, including untreated packaging wood. Insulation materials, such as fiberglass batts or foam board scraps. Metal components, such as mounting brackets or steel supports, recyclable as scrap.
Electrical and Electronic Waste	Potentially hazardous	Retired lighting fixtures and lamps, including fluorescent tubes, HID lamps, and LEDs. Wiring looms, control panels, sensors, switches, circuit boards, meters, and controllers removed during upgrades. Inverters and other PV system electronics that are damaged or replaced. May contain heavy metals (e.g., lead, cadmium, mercury) and must be handled as e-waste.

HVAC-Specific	Hazardous	Fluorinated refrigerants (R410A), which are ozone-depleting or high global warming potential gases. Used compressor oils that may contain pollutants or refrigerant traces. Contaminated filters, which may carry dust, mold, or biological matter, potentially requiring sanitary or biomedical disposal. Electronic control units from HVAC systems that may contain hazardous components.
Solar PV System Waste	Potentially hazardous	Damaged or substandard PV modules, composed of glass, silicon cells, and aluminium frames. Cable assemblies, junction boxes, and mounting hardware removed or left over from installation.
Chemical and Toxic Residues	Hazardous	Solvents, adhesives, sealants, and other chemical products used during retrofitting. Leftover cleaning agents or degreasers, often requiring proper labelling and disposal. Soldering residues, flux, or small capacitors from old equipment, potentially containing PCBs or heavy metals.
General Site and Office Waste	Non-Hazardous	Paper waste, food containers, and beverage bottles from workers' rest and meal areas. Used PPE (e.g., gloves, masks, disposable coveralls) and cleaning rags. Miscellaneous consumables, such as air filters, zip ties, and packaging films.
Packaging Waste	Non-hazardous	Cardboard boxes, wooden crates, and pallets from equipment and material deliveries. Plastic wraps, foam inserts, and cushioning materials from lighting, HVAC, and PV packaging. Strapping (metal or plastic) and other delivery packing residuals.

Table 3.5 -Types of waste that may be generated during CEGEB project construction phase

3.5. Environmental and Social Management

The environmental and social mitigation measures defined for the subproject have been organised in the table below to provide the technical basis for implementation and contractual obligations. The measures identified establish the requirements to manage environmental and social risks during construction and must be incorporated into the Contractor's Management Strategies and Implementation Plans (MSIPs).

Environmental and Social Management Matrix		
E&S Aspect	**Potential Impacts**	**Mitigation Measures**
Waste generation	Improper management of construction debris, electronic waste, hazardous substances, and packaging materials associated with PV components may result in pollution, health and safety risks, or regulatory non-compliance.	Develop and implement a Waste Management Plan detailing procedures for waste collection, segregation, on-site storage, transport, recovery or recycling, and final disposal. Coordinate with the Grenada Solid Waste Management Authority (GSWMA) in advance and throughout the construction phase to ensure proper handling, transport, and disposal of all waste streams. Provide training to workers on proper waste segregation, labelling, and safe handling procedures. Designate secure temporary storage areas within the College premises to hold waste until collection. Segregate waste streams at the source to facilitate appropriate handling, treatment, and disposal; ensure that incompatible waste types, particularly hazardous and non-hazardous materials, are not mixed. Maximize recycling and recovery of waste to the extent possible, with the aim of minimizing final disposal. Ensure safe recovery, labelling, and containment of refrigerants in accordance with standard operating procedures (SOPs) and arrange for their transport to licensed facilities. Ensure that all e-waste and hazardous materials are handled and disposed of by licensed and authorized entities. Contract waste collection and transport services only through entities authorized by GSWMA.

Air pollution and noise	Dust and noise from construction activities may affect indoor air quality and disturb campus building users.	Wet surfaces during dust-generating activities. Use low-noise equipment and restrict noisy tasks to non-peak hours. Install dust barriers where needed. Regularly inspect and maintain equipment to minimise emissions.
Water and soil pollution	Spills or leaks during construction activities may affect water and soil in the surrounding area.	Minor spills or leaks must be contained immediately to prevent soil or water contamination.
Worker health & safety	Risk of falls, electrical shock, heat stress, mold exposure, and injury from equipment use.	Provide training to all workers and relevant staff on applicable occupational health and safety measures prior to the commencement of construction activities. Conduct daily safety briefings focused on site-specific hazards and planned activities. Always enforce the mandatory use of appropriate personal protective equipment (PPE) on site. Ensure access to potable water, shaded rest areas, and scheduled breaks to prevent heat stress and fatigue. Install and maintain fall protection systems in accordance with applicable safety standards wherever work at height is required. If mold-affected areas are encountered during construction, ensure that remediation is carried out using safe, approved methods by trained personnel, in coordination with college authorities. Implement pest control measures, if needed, through licensed and qualified contractors using approved methods that minimise health and environmental risks. Establish a Code of Conduct for workers. Establish and monitor a Grievance Mechanism for workers.
In-campus community health & safety	Exposure to dust, noise, mold, and restricted access to facilities may affect comfort and health.	Communicate construction schedules, activities, and access restrictions in advance to the college community to ensure transparency and reduce confusion. Implement physical barriers or signage to clearly separate active work zones from areas occupied by students, staff, or visitors.

		Schedule works in a manner that minimises overlapping with occupied areas and avoids peak academic activity periods where possible. Ensure adequate ventilation in any enclosed spaces affected by dust, fumes, or moisture during and after construction activities. Conduct daily cleaning of work areas to prevent accumulation of debris and maintain general safety and hygiene conditions. Store construction materials in secured locations away from areas routinely used by students or staff within the college premises.
College operation disturbances	Noise, dust, and access restrictions may disrupt teaching activities, examinations, and administrative functions. Lack of coordination with college administration may aggravate these impacts.	Schedule high-noise activities (e.g., cutting, drilling, demolition) outside of class hours or during academic breaks whenever possible. Establish and communicate a work schedule in advance with the college administration to avoid interfering with key academic or administrative activities (e.g., exams, meetings). Erect temporary noise barriers around work zones adjacent to classrooms or administrative offices, especially during noisy operations. Minimise dust infiltration by sealing openings and ensuring proper ventilation controls near indoor learning spaces. Clearly demarcate and secure construction zones to prevent accidental entry by students or staff. Maintain safe pedestrian access routes and ensure emergency exits always remain unobstructed. Provide a designated liaison officer to maintain ongoing communication with the college staff. Establish a Grievance Mechanism accessible to the in-campus community, including students, teaching staff, and administrative personnel, to allow concerns or complaints to be raised and addressed in a timely and transparent manner.
Public safety	Trip hazards, falling objects, blocked access routes, and lack of communication may affect the public in college surroundings.	Secure construction zones with fencing and signage. Assign traffic marshals during works on parking area and deliveries. Post public notices with work schedules.

		Implement clear pedestrian detour routes.
Community disturbance	Temporary discomfort of community or neighbours due to noise, dust, material deliveries, or perceived safety risks.	Developed MSIP for traffic management. Schedule material deliveries during low-traffic hours. Use dust suppression methods near site boundaries. Post public notices with work schedules at entrances and visible locations. Respond to community concerns if raised.
Weather-related risks	Construction runoff and exposure to tropical weather may cause flooding, erosion, or equipment damage.	Protect storm drains with barriers. Store materials off the ground and under cover. Keep temporary waste deposits covered to prevent wind or rain exposure. Schedule outdoor works during dry weather periods whenever possible to minimise environmental impacts and safety risks. Develop a storm preparedness plan aligned with national regulations and early warning systems.
Participation and transparency risks	Limited inclusion of college stakeholders in project communication may lead to reduced trust, misalignment with college schedules, or avoidable disruption.	Implement a site-specific communication strategy. Provide regular updates to college administration and designated focal points. Ensure visibility of works schedule via noticeboards and digital channels. Activate and monitor a grievance mechanism accessible to all college users.

Table 3.6 - Potential impacts and mitigation measures for the construction phase at TAMCC

To ensure proper planning, accurate costing, and enforceability, the contractual clauses related to the proposed mitigation measures are presented in the table below. These clauses are intended for integration into the bidding documents and the General Conditions of Contract (GCC).

E&S Contractual Requirements	
E&S Aspect	**Proposed GCC Clause**
Waste generation	*The Contractor shall develop and implement a comprehensive Waste Management Plan as part of the MSIPs, detailing procedures for the segregation, secure storage, collection, transport, recycling, and final disposal of all waste streams.* *The Contractor shall consult with the GSWMA and coordinate all waste management activities with the Authority throughout the construction phase.*

	All hazardous waste shall be safely recovered, labelled, and transported only by licensed entities in compliance with national regulations and GSWMA requirements. *All workers shall receive training on proper segregation, labelling, and safe handling procedures.*
Air pollution and noise	*The Contractor shall be responsible for implementing effective controls to manage dust, noise, and emissions throughout the construction phase. Works producing significant noise or dust shall, wherever practicable, be scheduled outside peak occupancy hours. Suitable dust and noise barriers shall be installed where necessary, and low-noise equipment shall be prioritised whenever available. All equipment shall be routinely inspected and maintained to reduce emissions and noise.* *Monitoring of air quality and noise levels shall be undertaken at appropriate intervals to verify compliance with applicable environmental regulations and contractual requirements.*
Worker health & safety	*The Contractor shall prepare and implement a site-specific Occupational Health and Safety (OHS) Plan, as part of the MSIPs. The approved OHS Plan shall be implemented throughout construction, and compliance shall be documented.* *The Contractor shall prepare and enforce a Worker Code of Conduct that complies with all applicable national labour regulations and the World Bank's Labour and Working Conditions.* *The Contractor shall comply with and support the implementation of the Project's Grievance Mechanism for workers.*
In-campus community health & safety	*The Contractor shall establish and implement a contingency plan specifically designed for the operational characteristics and occupancy of the College buildings.* *Construction zones shall be fenced, clearly marked, and secured to restrict unauthorised access. Appropriate dust control measures, including sealing of openings and installing ventilation systems, shall be applied in adjoining areas.* *All internal and external circulation paths, including emergency exits, shall always remain unobstructed and fully operational.* *The Contractor shall coordinate in advance with College management to ensure that all necessary measures to prevent health and safety risks are effectively applied.*
College operation disturbance	*The Contractor shall ensure early coordination of the works schedule with College management to minimise interference with essential operational functions and activities.* *High-noise construction activities shall, whenever practicable, be undertaken preferably during College breaks, weekends, or periods of reduced occupancy. Temporary noise barriers shall be installed near occupied areas when required to reduce disruption.* *The Contractor shall maintain continuous communication with the appointed liaison officer to promptly address any disturbance-related concerns and shall comply with the Project's Grievance Mechanism, ensuring that complaints and concerns raised by College users are managed in a timely and effective manner.*
Public safety	*The Contractor shall ensure public safety around the College buildings during construction.* *Construction zones shall be secured with fencing and warning signage.*

Community disturbance	*The Contractor shall take all necessary measures to minimise disturbance to the surrounding community during construction.* *The Contractor shall develop and implement MSIP for traffic management. Material deliveries shall, wherever practicable, be scheduled during low-traffic hours to reduce congestion.* *Where works impact parking areas or traffic flow, traffic marshals shall be assigned to ensure safety and maintain order. Clear and safe pedestrian detour routes shall be established and maintained as required.* *The Contractor shall comply with and actively support the implementation of the Community Grievance Mechanism, ensuring that any concerns or complaints raised are addressed promptly and effectively.*
Weather-related risks	*The Contractor shall implement appropriate measures to minimise weather-related risks during construction.* *Outdoor works shall, wherever practicable, be scheduled during dry weather periods. Storm drains shall be protected with adequate barriers to prevent blockages and flooding.* *All construction materials shall be stored off the ground and under proper cover, and waste deposits shall be securely contained to avoid exposure to wind or rain.* *The Contractor shall develop and implement a storm preparedness plan in compliance with national regulations and aligned with early warning systems, in coordination with the National Disaster Management Agency (NaDMA) when required.*
Participation and transparency risks	*The Contractor shall develop and implement a site-specific communication strategy to ensure transparency and effective stakeholder engagement throughout all construction phases.* *The Contractor shall establish, activate, and monitor the performance of the Project's Grievance Mechanism, ensuring timely responses and proper documentation of all complaints and resolutions.*

Table 3.7 – Environmental and social contractual requirements for the construction phase at TAMCC

4. Monitoring and Reporting

4.1. Monitoring Objectives

Effective monitoring is essential to ensure that the environmental and social risks identified for TAMCC subproject are properly managed throughout implementation. Monitoring should aim to:

- Ensure that mitigation measures are implemented as planned.
- Assess the effectiveness of mitigation measures
- Allow for corrective actions where needed.
- Track performance indicators to detect deviations or unexpected impacts.
- Enable timely corrective actions to minimise risks.
- Provide documentation for reporting to national authorities, the World Bank, OECS and project stakeholders.

4.2. Monitoring and Reporting Responsibilities

The monitoring and reporting responsibilities outlined below may be adjusted, if necessary, to align with the final arrangements established in the Project Operations Manual (POM).

Building Level Focal Point:

The Building Level Focal Point, designated by College management, shall support monitoring and reporting by serving as the liaison between the Contractor, S&C Consultant, and the in-campus community. Responsibilities include facilitating site access, communicating building-specific requirements, and relaying staff and student feedback.

Contractor:

The Contractor shall be responsible for implementing and monitoring all environmental and social mitigation measures defined in the ESMP and the bidding documents. The Contractor shall appoint a qualified Environmental, Social, Health and Safety (ESHS) Officer to oversee effective performance and maintain accurate day-to-day monitoring records.

Supervision & Commissioning (S&C) Consultant:

The S&C Consultant shall ensure that all construction activities comply with the approved technical designs, contract, ESMP requirements, and work plans. The Consultant shall conduct regular site inspections, review the Contractor's monitoring data, and consolidate findings into monthly reports submitted to the National PIU. A dedicated Environmental and Social (E&S) Officer shall be appointed by the Consultant to verify the Contractor's performance and oversee and inform the effective implementation of all mitigation measures.

National Project Implementation Unit (National PIU):

The National PIU shall be responsible for managing the implementation of environmental and social requirements at the country level. Its responsibilities include reviewing monitoring reports, conducting spot checks, coordinating closely with Contractors and S&C Consultants, and preparing consolidated progress reports. These reports shall be submitted to the OECS Regional PIU in accordance with the reporting procedures established in the Project Operations Manual (POM).

Ministry of Climate Resilience, the Environment, and Renewable Energy (MCRERE):

Shall provide national-level oversight and coordination with relevant national agencies to ensure compliance with regulatory requirements, permits, and policy priorities, and to ensure that subproject implementation remains consistent with Grenada's national development and climate resilience goals.

OECS Regional Project Implementation Unit (OECS PIU):

The OECS PIU shall receive consolidated reports from the National PIUs across participating countries, validate overall environmental and social performance, and submit aggregated reports to the World Bank in accordance with the reporting procedures established in the Project Operations Manual (POM).

All documents and reports relevant to project monitoring shall be stored in the project files and made available for review in accordance with the responsibilities of the key institutions.

4.3. Monitoring Indicators

The table below presents monitoring indicators associated with the environmental and social aspects relevant to the implementation of the CEGEB project. Additional indicators may be proposed as needed during subproject implementation.

E&S Aspect	Monitoring Indicators	Means of Verification	Proposed frequency	Responsible for Collecting Data
Waste management	Volume generated for each type of waste (kg or m^3). Percentage of waste streams properly segregated at source. Number of loads collected and removed by licensed waste handlers.	Waste segregation logs. Disposal manifests or receipts issued by licensed waste handlers. Photographic records of storage, segregation areas, and removal activities.	Weekly, and at time of waste removal	Contractor (ESHS Officer); reviewed by S&C Consultant

Air emissions and dust	Verification of dust suppression measures in place (e.g., water spraying, material covering, barriers) (yes/no). Air quality parameters measured where required and compared against national standards or project-specific thresholds. Number of dust-related complaints received and addressed.	Daily visual inspection logs with dust control checklists. Air quality measurement reports, including calibration certificates and laboratory analysis when applicable. Complaints register linked to the project's Grievance Mechanism.	Daily during works	Contractor (ESHS Officer); reviewed by S&C Consultant
Noise levels	LAeq,15min (dB(A)) measured at designated indoor points and the site perimeter, compared with applicable regulatory limits or project-specific thresholds. Number of noise-related complaints received and resolved.	Noise measurement logs. Photographic evidence of implemented noise control measures (e.g., barriers, enclosures). Records confirming maintenance of noise control measures (e.g., schedules, inspections). Complaints register linked to the project's Grievance Mechanism.	Daily during works	Contractor (ESHS Officer); reviewed by S&C Consultant
Water and soil pollution	Number of recorded spills or leaks and corresponding corrective actions. Verification of runoff containment systems in place, where required (yes/no).	Spill/leak incident reports. Photographic evidence of spill or leak incidents and restored/recovered areas. Runoff containment inspection report.	After rain; and incident-based	Contractor (ESHS Officer); reviewed by S&C Consultant
Worker health & safety	Pre-employment medical clearance for all workers (yes/no). All workers using required PPE (yes/no). Number of toolbox talks conducted per week. Percentage of worker attendance to toolbox talks. Number of reported incidents or accidents and corrective actions implemented. Medical evaluations conducted after reported work-related incidents (yes/no). Lost Time Injury Frequency Rate. Number of worker complaints received and addressed.	Valid medical fitness certificates or health cards for 100% of workers, issued by authorised occupational health professionals. PPE compliance checklists. Daily visual inspection logs of work areas. Toolbox talk records including date, topic, and participant attendance list. Incident/accident log with root cause analysis and corrective measures documented. Post-incident medical evaluation certificates. Worker complaints register linked to the project's Grievance Mechanism.	Daily during works	Contractor (ESHS Officer); reviewed by S&C Consultant
In-campus community health & safety	Verification of work zones segregation (yes/no). Number of incidents affecting campus building users. Medical evaluations conducted after reported campus building user health & safety issues (yes/no). Number of complaints received from campus building users related to health and safety.	Work zone segregation checklists. Daily visual inspection logs. Incident/accident investigation reports. Medical evaluation certificates for affected members of the in-campus community, issued following reported incidents	Daily during works	Contractor (ESHS Officer); reviewed by S&C Consultant

		Campus building user complaint register linked to the project's Grievance Mechanism.		
College operation disturbance	Verification of planned disruptions communicated in advance (yes/no). Number of unplanned service interruptions. Average duration of unplanned service interruptions. Verification that emergency access routes or critical facilities remain unobstructed (yes/no). Advance notifications for high-impact works (yes/no). Number of complaints from College community related to operational disruptions.	Communication records shared with campus building management. Copies of distributed notices. Service downtime logs. Contractor incident reports. Inspection checklists. Photographic evidence of working area conditions. College community complaint register linked to the project's Grievance Mechanism.	Daily during works	Contractor (ESHS Officer); reviewed by S&C Consultant
Public safety	Required signage and barriers installed (yes/no). Public safety notices displayed at site surroundings, where required (yes/no). Temporary pedestrian detour routes established and maintained (yes/no). Pedestrian management measures implemented (yes/no). Number of unsafe access incidents reported. Number of complaints from members of the public related to safety issues.	Work zone inspection checklists. Photographic evidence of installed signage, fencing, and barriers. Incident reports for unsafe access events. Public health and safety complaints register linked to the project's Grievance Mechanism.	Daily during works	Contractor (ESHS Officer); reviewed by S&C Consultant
Community disturbance	Delivery scheduling procedures in place (yes/no). Traffic management measures implemented around the site (yes/no). Public notices issued to nearby residents or businesses (yes/no). Number of complaints from community members.	Delivery schedules. Contractor's delivery logs. Traffic management plans. Photographic evidence of traffic management measures. Copies of distributed notices, communication logs, and acknowledgement receipts when applicable. Community complaints register, linked to the project's Grievance Mechanism.	Daily during works	Contractor (ESHS Officer); reviewed by S&C Consultant
Weather-related risks	Materials stored securely and protected (yes/no). Storm preparedness plan active (yes/no). Number of weather-related damages or incidents reported after extreme weather events.	Storage inspection checklists. Photographic evidence of covered and secured materials. Approved storm preparedness plan. Storm preparedness plan activation records. Post-event inspection reports. Photographic evidence of affected areas and damaged materials.	Weekly; and before and after storms	Contractor (ESHS Officer); reviewed by S&C Consultant

Participation and transparency	Number of stakeholder communication events conducted. Percentage of grievances resolved within the defined timeframe.	Meeting agendas, attendance sheets and minutes. Photographic evidence of communication events. Grievance register linked to the project's Grievance Mechanism, resolution tracking logs, and confirmation records of closed cases.	Ongoing	Contractor (ESHS Officer); reviewed by S&C Consultant; validated by PIU Environmental Specialist
Overall E&S performance	Number of non-compliance findings. Percentage of corrective actions implemented within deadline.	E&S inspection reports, monitoring checklists, and non-compliance tracking logs verified by the S&C Consultant. Corrective action plans, follow-up inspection reports, and contractor's compliance confirmation records.	Weekly	Contractor (ESHS Officer); reviewed by S&C Consultant; validated by PIU Environmental Specialist

Figure 4.1 - Monitoring indicators proposed for each Environmental and Social Aspect.

5. Implementation Arrangements

The implementation of environmental and social measures under the Caribbean Efficient and Green-Energy Buildings Project (CEGEB) will involve close coordination among national agencies, project entities, and on-site actors. These arrangements will be designed to ensure full compliance with Grenada's environmental legislation and the World Bank's Environmental and Social Standards (ESSs), as outlined in the Environmental and Social Management Framework (ESMF).

The Project Implementation Unit (PIU), established under the Ministry of Climate Resilience, the Environment & Renewable Energy (MCRERE), will be responsible for planning, coordinating, and supervising project activities in full alignment with the ESMF and the Project Operations Manual (POM). The PIU will also oversee stakeholder engagement, environmental and social risk management, and the grievance redress mechanism, ensuring consistent implementation across all interventions.

College building managers will play a central role at the site level, acting as focal points between the PIU, contractors, and building users. They will support day-to-day coordination, ensure that disruptions are properly communicated, and facilitate the monitoring of mitigation measures.

While the MCRERE will provide overall leadership and strategic oversight for the project, the Environmental Management Department (EMD) within the MCRERE will ensure environmental compliance, approve relevant permits, monitor waste management practices, and oversee the implementation of the mitigation and monitoring measures defined in the ESMPs.

A National Coordination Committee (NCC), chaired by the MCRERE, will provide strategic oversight at the national level, facilitate inter-agency coordination, and ensure that CEGEB activities remain aligned with Grenada's energy, environmental, and infrastructure policies.

Other relevant agencies and their expected roles will include, but may not be limited to:

- Ministry of Infrastructure and Physical Development, Public Utilities, Civil Aviation & Transportation: Oversee national infrastructure development, public utilities regulation, and transportation systems coordination.
- Ministry of Education: Ensure compliance with national education policies and safety requirements.
- Ministry of Health, Wellness & Religious Affairs: Provide technical oversight and required authorisations, particularly regarding risks related to pests and mold within the campus buildings.
- Ministry of Finance: Provide oversight on financial compliance and reporting.
- Department of Labour: Ensure that employers and employees comply with all Labour Laws.
- Grenada Electricity Services Ltd. (GRENLEC): Technical coordination, approvals, and grid connection support for solar PV systems and other energy efficiency measures.

- Public Utilities Regulatory Commission (PURC): Oversee the regulation of electricity and other utilities in Grenada, ensuring compliance with technical, environmental, and safety standards.
- Grenada Solid Waste Management Authority (GSWMA): Ensure that contractors follow national waste management regulations and coordinate disposal through licensed facilities.
- Grenada Fire Department: Ensure compliance with fire safety codes, including inspection of upgraded systems and access routes.
- Royal Grenada Police Force: Responsible for traffic management, public access, and safety coordination in public areas.

6. Stakeholder Engagement

6.1. Consultation Process and Outcomes

The Stakeholder consultation for the Caribbean Efficient and Green Energy Buildings (CEGEB) Project in Grenada was carried out in accordance with the Stakeholder Engagement Plan (SEP), with the objective of supporting risk identification, refining mitigation strategies, and ensuring that technical interventions respond to the operational context of each site.

Objectives

The consultation process was designed to:

- Involve stakeholders in identifying environmental and operational risks associated with project implementation.
- Collect information on building conditions, infrastructure vulnerabilities, and user priorities.
- Clarify expectations regarding the long-term operation and maintenance of installed systems.
- Promote transparency and raise awareness through the early disclosure of project objectives and scope.

Methodology

Stakeholder consultations were carried out using a structured questionnaire distributed primarily through Google Forms. To address potential barriers to digital access, individual interviews were conducted with stakeholders who were either unable or preferred not to respond online. This combined approach facilitated broader participation and ensured greater inclusivity while managing logistical constraints.

In total, 80 stakeholders representing all buildings included under the Grenada CEGEB subprojects were invited to participate. Although engagement presented some challenges, 66 valid responses were successfully collected, providing a solid basis for analysing stakeholder perspectives.

The questionnaire explored:

- Awareness and perceived relevance of the project.
- Anticipated environmental and social impacts.
- Recommended mitigation measures for construction works within operational buildings.
- Expectations regarding roles and responsibilities for long-term maintenance.
- Preferred forms of communication and grievance mechanisms during implementation.

Stakeholder Profile

Stakeholders included:

- Facility and infrastructure managers.
- Technical and maintenance staff with direct insight into building systems.
- Public servants and users of government facilities.
- Representatives of service providers and associated entities.

Although coverage varied across buildings, the sample included in most cases staff with operational responsibilities and building users, ensuring informed feedback. Stakeholders were classified according to their roles, influence, and interest levels.

Key Findings

Stakeholder insights were in general consistent with previous risk assessments and confirmed widespread support for energy efficiency improvements. The findings of the consultation process are summarised below:

- Project Awareness: Approximately 45.5% of respondents reported having prior knowledge of the CEGEB project before completing the survey.
- Stakeholder Relevance: 86.4% of respondents were directly associated with one or more of the assessed buildings, including facility staff, users, and technical personnel.
- Perceived Importance: Following a brief explanation of the project objectives, 94% of respondents rated the initiative as important or very important for both building users and the wider community.
- Disruption of Services: Respondents highlighted the need to minimise interference with routine operations during implementation. Specific concerns included noise, movement of equipment, and workspace disruptions. Emphasis was placed on ensuring close coordination with facility managers to schedule works appropriately and avoid critical times.
- Waste Management: Proper handling, secure temporary storage, and final disposal of obsolete equipment (e.g., air-conditioning units and lighting fixtures) were seen as critical. Respondents underscored the importance of pre-planning and early coordination with the Grenada Solid Waste Management Authority to manage associated waste streams effectively.
- Communication: Stakeholders expressed the need for timely communication prior to any intervention. Preferred channels included:
    - Email notifications
    - Direct updates through designated focal points
    - On-site noticeboards and visual cues
- Long-Term Responsibilities: Some respondents requested further clarification regarding:
    - Responsibility for maintenance of installed systems post-implementation.
    - Training timelines and target staff for system operation.
    - Expected lifespan and replacement planning for the equipment.
    - For TAMCC stakeholders, ensuring continuity of academic activities and minimising disruptions to campus operations is a key priority.

The stakeholder consultations underscored the need for a well-structured Grievance Mechanism to ensure that all project and subproject stakeholders have accessible, transparent, and efficient channels to express concerns and receive timely resolutions.

6.2. Grievance Mechanism

A Grievance Mechanism (GM) will be established and maintained throughout the implementation TAMCC subproject to ensure that any concerns or complaints raised by stakeholders are received, addressed, and documented in a transparent, timely, and accessible manner.

The GM will be implemented in line with the CEGEB Environmental and Social Management Framework (ESMF) and the Grenada Stakeholder Engagement Plan (SEP) and will comply with the requirements of the World Bank Environmental and Social Standard 10 (ESS10), ensuring inclusivity, accountability, and effective resolution of grievances.

Objectives

- Provide an accessible and confidential platform for stakeholders to raise concerns related to project activities.
- Ensure timely and transparent resolution of grievances.
- Strengthen accountability, trust, and engagement with affected stakeholders.

Scope of complaints

The GM shall address, but not be limited to, the following types of complaints:

- Construction-related impacts (e.g. noise, dust, vibration, restricted access, inconvenience).
- Health and safety conditions for all campus users, College community members and workers.
- Accessibility concerns, particularly affecting persons with disabilities.
- Disruptions to campus activities or regular operations.
- Waste management practices, including hazardous waste.
- Any other environmental or social risks identified by stakeholders.

Focal Points and Responsibilities

The GM shall be implemented through the following focal points:

- Building-Level Focal Points: College managers or designated officers shall act as the initial point of receipt for grievances raised within their facility. They shall collect complaints and promptly forward them to the PIU or the assigned CLO for registration, documentation, and follow-up.
- Community Liaison Officers (CLOs): CLOs shall serve as the primary interface between campus building users, the community, and the PIU. They shall register all grievances,

ensure proper documentation, track their progress within the central GM system, and provide timely feedback to complainants. CLOs shall also consolidate data received from campus building-Level Focal Points for reporting purposes and support the overall management of grievances at the project level.

- PIU Environmental & Social Specialists: Shall manage, resolve, and document grievances in line with the procedures outlined in the CEGEB Environmental and Social Management Framework (ESMF) and the Grenada Stakeholder Engagement Plan (SEP). They shall ensure compliance with the World Bank's ESS10, maintain the central grievance database, prepare periodic reports, and coordinate with the OECS Regional PIU where relevant.
- Contractors: Contractors shall establish and operate a dedicated Worker Grievance Mechanism, aligned with ESS2 and the procedures defined in the SEP. They shall ensure confidentiality, non-retaliation, and fair resolution of workplace-related complaints. Contractor-level mechanisms shall be integrated into the central PIU grievance system to allow consolidated monitoring, reporting, and oversight.

Accessibility and non-retaliation

The GM shall ensure:

- Accessibility to all campus users, College community members and workers. Anonymous submissions shall be allowed.
- Protection from retaliation shall be guaranteed for all complainants.

Submission channels

Public noticeboards providing instructions and contacts for submitting grievances shall be widely available. Multiple submission channels shall be implemented, including:

- Secure complaint boxes located within TAMCC campus buildings.
- Dedicated email address and secure web-based form managed by the PIU.
- Telephone hotline or WhatsApp number (where feasible).
- In-person submissions to campus building-level focal points, Community Liaison Officers (CLOs), or E&S Specialists within the PIU.

Timelines for Response

- Acknowledgement: Within 3 working days of receipt.
- Formal Response: Within 15 working days, where feasible.
- Extensions: In complex cases, delays shall be justified and documented in the Grievance Log.

Record-Keeping and Reporting

A Grievance Log will be maintained by the PIU, recording:

- Date and method of submission.

- Nature of the complaint.
- Responsible party assigned for resolution.
- Actions taken and outcomes.
- Feedback from the complainant (if provided).

Grievance trends will be analysed and reported regularly by the PIU, consolidated at the national level, and submitted to the OECS Regional PIU, communicating aggregated findings to the World Bank.

Support for Vulnerable Groups

In order to provide support for vulnerable groups, the GM shall ensure that:

- Verbal submissions will be accommodated where literacy or accessibility is a barrier.
- Translation and interpretation services shall be provided when necessary.
- Sensitive complaints will be handled confidentially, ensuring cultural sensitivity and non-discrimination.

Visibility and Awareness

The GM will be publicised widely through:

- Posters and noticeboards in visible areas within the campus buildings.
- Flyers distributed prior to construction works.
- Online resources and accessible formats for persons with disabilities.

7. ESMP Implementation Schedule and Cost Estimates

7.1. Implementation Scheduling

The ESMP is intended to serve as a dynamic management tool supporting risk prevention, environmental compliance, and stakeholder engagement throughout the project lifecycle; therefore, its timing shall remain fully aligned with the overall execution schedule of the Caribbean Efficient and Green-Energy Buildings (CEGEB) Project.

Implementation of the ESMP shall begin prior to the mobilisation of works, starting with the inclusion of environmental and social obligations in tender documents and continuing through the recruitment of contractors and the finalisation of executive project designs. Key milestones include:

- Incorporation of ESMP provisions into bidding documents and General Conditions of Contract (GCC).
- Pre-construction planning, including preparation of Management Strategies and Implementation Plans (MSIPs) by the contractor, subject to review and approval by the Supervision Consultant in coordination with PIU and College management representatives.
- Execution of site works, during which all environmental, health and safety, and stakeholder engagement measures, must be actively implemented and monitored.
- Ongoing reporting and grievance management.
- Post-construction clean-up, dismantling of temporary facilities, and restoration of affected areas.

To ensure proper scheduling, the PIU, in coordination with the Supervision & Commissioning Consultant and contractors, shall integrate all ESMP milestones into the master project implementation schedule. This alignment ensures that environmental, health and safety, and stakeholder engagement measures are initiated at the correct stages and tracked against the CEGEB implementation timeline.

7.2. Implementation Costs

The table below outlines the relevant cost categories, representing anticipated expenditures directly associated with environmental and social management measures, to be integrated into the overall project budget. Specific amounts for each cost category shall be determined during procurement planning, based on contractor bids, detailed implementation plans, and the confirmed scope of works.

ESMP Implementation Costs	
Cost Category	**Description**
Waste Management	Containers for on-site waste segregation. Equipment for safe handling of hazardous waste. Contracted service for transport and disposal of bulky or hazardous waste. Waste management authority fees for specific bulky or hazardous waste.
Worker Health & Safety	Personal Protective Equipment (PPE) for each task. First aid kits and emergency response supplies. Hiring of H&S Technician.
In-campus Health & Safety	Safety signage in common areas. Temporary barriers to isolate work zones. Portable ventilation or filtration aids. Air quality monitoring and laboratory testing. Noise monitoring equipment. Any other items relevant for ensuring safety within campus. Mold removal and treatment measures, if required.
College Operations	Temporary acoustic panels. Dust suppression barriers or sheeting. Informational signage and floor markings.
Public Safety	External fencing for active work zones. Directional and hazard signage. Basic traffic control elements (cones, barricades, temporary signage).
Weather-Related Risks	Stormwater drain protection (e.g., covers, filters). Waterproof storage for materials. Storm readiness and response supplies.
Stakeholder Communication & Grievance Mechanism	Noticeboards, printed schedules, and visual materials. Social media content, WhatsApp, and digital communication. Dedicated staff for public outreach and grievance handling. Complaint boxes, forms, and tracking system (physical or digital).
Environmental & Social Supervision	Hiring of Environmental and Social Specialist(s) for monitoring, reporting, and stakeholder engagement.

Table 7.1 - Anticipated ESMP Implementation Cost Categories.