

UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

DEVELOPMENT OF A PROJECT MANAGEMENT PLAN FOR THE DESIGN AND
CONSTRUCTION OF A CENTER FOR ADOLESCENT RENEWAL AND
EDUCATION IN CUL DU SAC, SAINT LUCIA

LYNDON BARRY GEORGES

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Master in Project Management (MPM) Degree

Sophia Crawford Mora
TUTOR

Rubén Dario Alzate Mora
REVIEWER No.1

Juan Camilo Delgado Acevedo
REVIEWER No.2



Lyndon Barry Georges
STUDENT

DEDICATION

*This research project is dedicated to my children, Lakijea and Yahir, for
loving
Daddy unconditionally and giving him reasons to be a better man.
To my beautiful wife, Mabel E Cacho Georges; my mother, Fidelia ; brothers
Lindsay and Desley and sister Kezia, thanks for the Continuous support and
encouragement to keep striving .
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ABSTRACT

The objective of this document was to develop a Project Management Plan for the design and construction of the new Center for Adolescent Renewal and Education (CARE) in Cul Du Sac, Saint Lucia. With the development of this Project Management Plan, it is hoped that there will be an improved chance of project success, through the provision of a management template that will serve as a roadmap to assist project managers to keep their project on track by showing how the project will be executed and monitored from inception to completion. As part of the objective, an analysis of the end results will be conducted to establish whether the project had favorable or unfavorable outcomes to regenerative and sustainable development.

The realization of educational projects has always been fundamental to the government of Saint Lucia; however, historically projects have run into many problems and shortcomings, resulting in financial implications and inefficient use of funds. Currently there exists a lack of structure in project implementation from inception to completion. Presently, the use of a Project Management Plan is either not practiced, or seldom implemented to its full extent for project realization and implementation. As a result of these deficiencies most government projects have become a burden to the state which now has to obtain already scarce financial resources to undertake corrective measures to complete these projects.

Consequently, this project sought to engage in project management research for the design and construction of the first phase of the Center for Adolescent Renewal and Education project (C.A.R.E). This project upon its completion will inform the essential characteristics and structure of corresponding management plans: Integration management plan, scope, schedule, costs, quality, resources, communications, risks, procurement, and stakeholder Management plan. Hence an Analytical Research methodology and the guide provided by the Project Management Institute in the PMBOK® Guide 6th Edition, 2017; PMBOK® Guide 7th Edition, 2021; and other supplementary bibliographical research documents were used to develop the Project Management Plan for this research project.

. It is therefore anticipated that the development of a Project Management Plan for the design and construction of the first phase of the Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia will assure greater management and control of activities and resources throughout the project's life cycle in a structured manner.

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ABBREVIATIONS AND ACRONYMS

ADP	The Adolescent Development Programme
CARE	Center for Adolescent Renewal and Education
CCSLC	Caribbean Certificate of Secondary Level Competence
CXC	Caribbean Examination Council
CVQ	Caribbean Vocational Qualification
GOSL	Government of Saint Lucia
ILO	International Labour Organization
NCTVET	National Council on Technical and Vocational Education and Training
PMI	Project Management Institute
TVET	Technical Vocational Educational Training
UNDP	United Nations Development Programme
CARE	Center for Adolescent Renewal and Education (NGO)
C.A.R.E.	Center for Adolescent Renewal and Education (Project)
PMBOK	Project Management Book of Knowledge
NFPA 72®	National Fire Alarm and Signaling Code®
O.E.C.S	Organization of Eastern Caribbean States

EXECUTIVE SUMMARY

It has been Challenging for the administration of the Center for Adolescent Renewal and Education (CARE) over the years as issues linked to the management of its operations needed timely solutions. This triggered the idea to upgrade training facilities, capacity of instructors, and offer coordinated apprenticeship services from national stakeholders to Saint Lucia's youth.

The use of a Project Management Plan has not been common practice in project realization and implementation in the local context. The adoption of project management principles has been attempted, but due to knowledge deficiencies it has been sidelined, and projects have become unsuccessful and financial burdensome to complete.

The intention of this study has been to develop a Project Management Plan for the design and construction of the new Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia. This plan would allow for adequate management and control of all activities leading to finalizing the first phase of construction, and documenting lessons learned during the project's life cycle.

In St. Lucia, the Ministry of Education, Innovation, Science, Technology and Vocational Training together with the Center for Adolescent Renewal and Education (CARE), experienced demands for educating the marginalized and underprivileged youth with Technical Vocational and Educational Training (TVET) programs in many communities, reemphasizing the need for the new larger facility, with greater outreach and offering a wider range of (TVET) certification programs.

As partial fulfillment of the requirements for a Master's in Project Management (MPM) Degree, the general objective of the Project was to develop a Project Management Plan, aligned to best practices of the Project Management Institute (PMI), for managing the procedures and processes that would increase the possibilities of project success, for the design and construction of A Center for Adolescent Renewal and Education (C.A.R.E), and to assess the projects end results using regenerative and sustainable development.

The specific objectives formulated to achieve the proposed general objective were as follows:

To create a Project Charter that authorizes the project and documents the objectives, goals, and business case of the project. To create an Integration Management Plan that ensures all project processes and activities run efficiently and the project is kept within budget. To create a Scope Management Plan which ensures the documenting, monitoring and control of project resources required to achieve project objectives. To create a Schedule / Time Management Plan which seeks to ensure the prioritization of planned project activities and their achievement or realization, for greater productivity and efficiency. To develop a Cost Management Plan for managing and controlling overall project costs aligned to resources and activities as per cost baseline and budget. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality, adhering to quality standards and project objectives. To develop a Resource Management Plan that assists in optimizing resource availability and use, required for projects' successful completion. To create a Communication Management Plan that guides, outlines, and details

communication needs and expectations for project deliverables. To develop a Risk Management Plan that assists in the proactive identification, monitoring, and analysis, of internal or external situations that may arise and impact the project positively or negatively. To develop a Procurement Management Plan that defines the methodological approach for managing the processes of obtaining goods and services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project. To create a Stakeholder Management Plan that ensures the effective involvement, identification, control, and categorization of stakeholders.

The validation of the project was favorable in the fields of regenerative and sustainable development.

The methodology used for the research was analytical. (PMBOK® Guide) 6th and 7th editions served as primary theoretical sources for the development of the Project. Interpersonal meetings were held with the administration of CARE, the Ministry of Education and other key stakeholders attached to the project. Additional information was gathered from site investigations and video conferencing with personnel from private sector agencies operating similar businesses as the functions to occupy the vocational School. The internet was used to conduct research and investigations. These research processes resulted in the creation of the subsidiary plans used to develop the Project Management Plan for the design and construction of the Center for Adolescent Renewal and Education.

Government is by far the biggest employer in the island of Saint Lucia. Construction works are some of the major contractual works offered to private sector companies. Principle issues are financial, and many projects go into cost overruns due to bad planning. The most relevant conclusion which can assist to curb these recurring issues is Integration management. If a project commences badly most likely it would end very unfavorable. The Integration Management Plan will give the project long term purpose while simultaneously aligning stakeholders with the processes to develop the project from inception to completion. The plan will establish the road map to lead the project to success and educate stakeholders on essential components vital to the project's development lifecycle, by using charts and templates to identify, define, combine, unify, inter alia processes and project management activities encompassing a proposed project.

The Architectural Section of the Department of Physical Development and Urban Renewal (DPDUR) Is one of governments' key deliverable oriented implementing agencies, and without effective and efficient project management procedures it becomes chaotic both financially and managerially. Project Integration Management Is recommended as a result driven process that creates transparency and structures project operations through gathering of critical information that would influence project activities throughout the projects' lifecycle.

1 INTRODUCTION

The main purpose of the development of a project management plan for the design and construction of a Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia, is to integrate what has been studied during the master's degree program and to focus on the practical application of concepts of Project Management, Regenerative and Sustainable development as part of an integral approach to derive a Project Management Plan template that can be used as a guiding instrument for this and future projects. The PMBOK® Guide 6th Edition, 2017 and PMBOK® Guide 7th Edition, 2021 are used as principal literature sources together with many other supplementary bibliographical research documents guiding the development of the research project.

1.1. Background

Since the creation of the Center for Adolescent Renewal and Education (C.A.R.E.) in 1993 by the Presentation Brothers, there has been increasing demands for educating the marginalized and underprivileged youth with Technical Vocational and Educational Training (TVET) programs in many communities in Saint Lucia. For several years, the administration of CARE has been burdened with the management of its operations at learning centres, due to lack of proper monitoring performances for both teachers and learners; tedious inventory and accountability issues; increase maintenance and operational costs; not withstanding inadequate staffing due to limited finances.

At present, the Center for Adolescent Renewal and Education (C.A.R.E.) offers alternative educational programming that emphasizes life skills development and Technical Vocational and Educational Training (TVET) in a number of skill areas for marginalized youth (primarily, ages 12-19 years) as indicated in Section 2.1.4 (Products offered) at four (4) satellite locations on island. The consolidation of the four (4) existing facilities at a new location will seek to address outstanding issues and offer an improved program in conjunction with the support of the Ministry of Education, Sustainable Development, Innovation, Science and Technology. Through the assistance of the India-UN Development Partnership Fund, a total of USD 871,314.81 has been allocated to CARE Limited (a registered non-governmental organization (N.G.O.) in Saint Lucia), and the Ministry of Education, towards the realization of the design and first phase of construction of the training institute at Cul De Sac, Castries.

The newly built Center for Adolescent Renewal and Education (C.A.R.E.) facility will be an upgrade of Saint Lucia's capacity to provide impactful vocational training for marginalized youth by seeking to address the need to upgrade training facilities and the capacity of instructors; in addition to offering coordinated apprenticeship services from national stakeholders to Saint Lucia's disenfranchised youth. It will also cater to individuals who are not capable of learning through the standard education system but are productive through Technical Vocational and Educational Training (TVET) programs. As one of its strategies for reducing crime which sociologists and others have linked to the marginalized youth, the government of St. Lucia through its Ministry of Education has therefore identified the need to educate these individuals through Technical Vocational and

Educational Training (TVET), thus empowering students with sought after skills for the practical labor force. In that regard, the Ministry of Education will provide financial support for the operation of the Center for Adolescent Renewal and Education (C.A.R.E).

1.2. Statement of the problem

Due to the escalating increase in crime within the past 10 years, which according to research is perpetrated mostly by individuals considered at-risk in the communities, there has been greater urgency for technical-vocational type programmes offered primarily to be offered to marginalized youth. As a consequence, the design and construction of a new Center for Adolescent Renewal and Education has become even more paramount.

Historically, St Lucia has had its fair share of failed or incomplete projects because of the absence of project management plans. Presently, the use of a project management plan is not practiced for project realization and implementation. While concepts are seemingly implemented, there is no profound or structured use of project management principles being adopted. It is therefore anticipated that the development of a project management plan for the design and construction of the new Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia will assure greater management and control of activities and resources throughout the project's life cycle in a structured manner.

1.3. Purpose

CARE has been in existence in St. Lucia for the past twenty-nine (29) years. Throughout its journey of offering technical/vocational and academic courses, the institution has successfully established a few learning centers in different communities around St. Lucia of which four are presently fully functional. Management of the operations at the learning centers has constantly burdened the institution and has brought to light some of the challenging issues faced by the administration of the institution; namely, the inability to properly monitor the performance of both teachers and learners, the tedious nature of dealing with inventory and accounting issues, difficulty in implementing effective and or efficient maintenance schedules for each physical infrastructure and the financial burden of increased fees for the use of utility services.

The administration of the institution is of the opinion that the implementation of a new centrally located Center for Adolescent Renewal and Education with accessibility for all will provide a sense of relief and improved management of resources. As a new construction project, the goal is to design and construct the first phase of an aesthetically pleasing state-of-the-art Technical /Vocational and Educational Training (TVET) facility that is functional, secure, sustainable and in accordance with International Labour Organization (ILO) requirements as well as regulatory standards for local, regional, international, and Technical /Vocational and Educational Training (TVET) facilities. It is hoped that the end result will engender ownership and pride in all involved in the day-to-day operations of this new facility.

The intention of this study is to develop a project management plan for the design and construction of the new Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia. This allows for adequate management and control of all activities leading to the finalizing of the first phase of construction inclusive of documentation of lessons learned along every stage of the project's life cycle. The aim is for this project management plan to be used as a guide for future project phases.

A successfully developed Project Management Plan for the design and construction of the Center for Adolescent Renewal and Education will be beneficial in assuring the development of a structured project management plan template to guide and positively impact the phases and processes throughout the project's life cycle leading to the successful implementation of the project.

1.4. General objective

To develop a project management plan aligned to best practices of the Project Management Institute (PMI), for managing the procedures and processes that would increase the possibilities of project success for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E), and to assess the project's end results using regenerative and or sustainable development.

1.5. Specific objectives

1. To create a Project Charter that authorizes the project and documents the objectives, goals, and business case of the project.

2. To create an Integration Management Plan to ensure that all project work processes and activities run efficiently in a coordinated manner for timely completion of project and keep within budget.
3. To create a Scope Management Plan which ensures all project activities are realized within a set structure that enables documenting, monitoring and control of project resources which are required to achieve project objectives and success.
4. To create a Schedule / Time Management Plan which seeks to ensure the prioritization of planned project activities and their achievement or realization within stipulated time frames, for greater productivity and efficiency.
5. To develop a Cost Management Plan for managing and controlling overall costs aligned to resources and project activities in relation to the cost baseline and ensuring they are kept within budget limits.
6. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality that adheres to quality standards and project objectives throughout the project's life cycle.
7. To develop a Resource Management Plan to assist in optimizing resource availability and use, by identifying, quantifying, acquiring, and managing the resources required for project's successful completion.
8. To create a Communication Management Plan to serve as a framework that guides, outlines, and details communication needs and expectations to meet project deliverables throughout the life of the project.

9. To develop a Risk Management Plan which would assist in the proactive identification, monitoring, and analysis of internal or external situations that may arise and impact the project positively or negatively throughout its life cycle.
10. To develop a Procurement Management Plan to define the methodological approach for managing the processes of obtaining goods and or services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project.
11. To create a Stakeholder Management Plan that ensures the effective involvement, identification, control, and categorization of stakeholders.
12. To explain, using regenerative and sustainable development, the relationship and impact of the execution of the project and the operation of the final product to establish which effects of the end results favor or disfavor regenerative or sustainable development.

2 THEORETICAL FRAMEWORK

In this chapter the theoretical elements for the development of a project management plan for the design and construction of a Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia are presented. These theoretical elements serve as a roadmap guiding the defining of research objectives and the gathering of information useful to deriving arguments and conclusions as well as making predictions relating to the Project.

2.1 Company/Enterprise Framework

This subsection provides a general overview of CARE's governing framework, its historical background, values, organizational principles guiding operational strategies for the provision of requisite services.

2.1.1 Company/Enterprise Background

History and The Programme

The Presentation Brothers, well known as a worldwide teaching congregation, launched the project C.A.R.E in St Lucia, in April 1993. Brother Dominic Brunnock was appointed the Project Director. CARE opened its doors to the first group of twelve young people at the Marchand Community Centre in Castries, St. Lucia. The demand for the programme was so great that in February 1994 two additional centres were opened in the Castries area. In September of 1994, two full-time skills

training programmes, namely, Electrical Appliance Repairs and Computer/Secretarial came on board.

Appeals from communities outside the Castries area to extend the programme began to flow in. In September 1995, CARE opened a centre in Vieux Fort, but this centre was later closed because that local community did not favour the original programme and wanted it changed to suit their preference. In September 1996, the administrators of CARE. decided to start an ‘Adolescent Development Programme Centre’ in Anse La Raye and Gros Islet. Also, two more skills training programmes were established in the Castries area. Then in September 1997, skills training in ‘Catering/Arts & Craft’ and ‘Carpentry’ started at the Anse La Raye centre. CARE was also pressed into opening another skills centre in Vigie, with offerings of ‘Auto Repairs’ and ‘Electrical Installations (care_admin, 2020).

The philosophy of CARE is articulated in its motto and mission and vision statements presented below.

2.1.2 Motto, Mission, and Vision statements

Motto

“Success is achieved through striving” (CARE, 2022-2023)

Mission

CARE is a community-based, indigenous, voluntary organization established to help disadvantaged and marginalized youth take control of their lives and destinies.

This is achieved through a programme geared toward the promotion of self-empowerment. Self-empowerment provides the opportunity to believe in oneself, the ability to identify the alternatives in any situation, and to choose one of the alternatives on the basis of one's values, priorities, and commitment (CARE, 2022-2023)

Vision

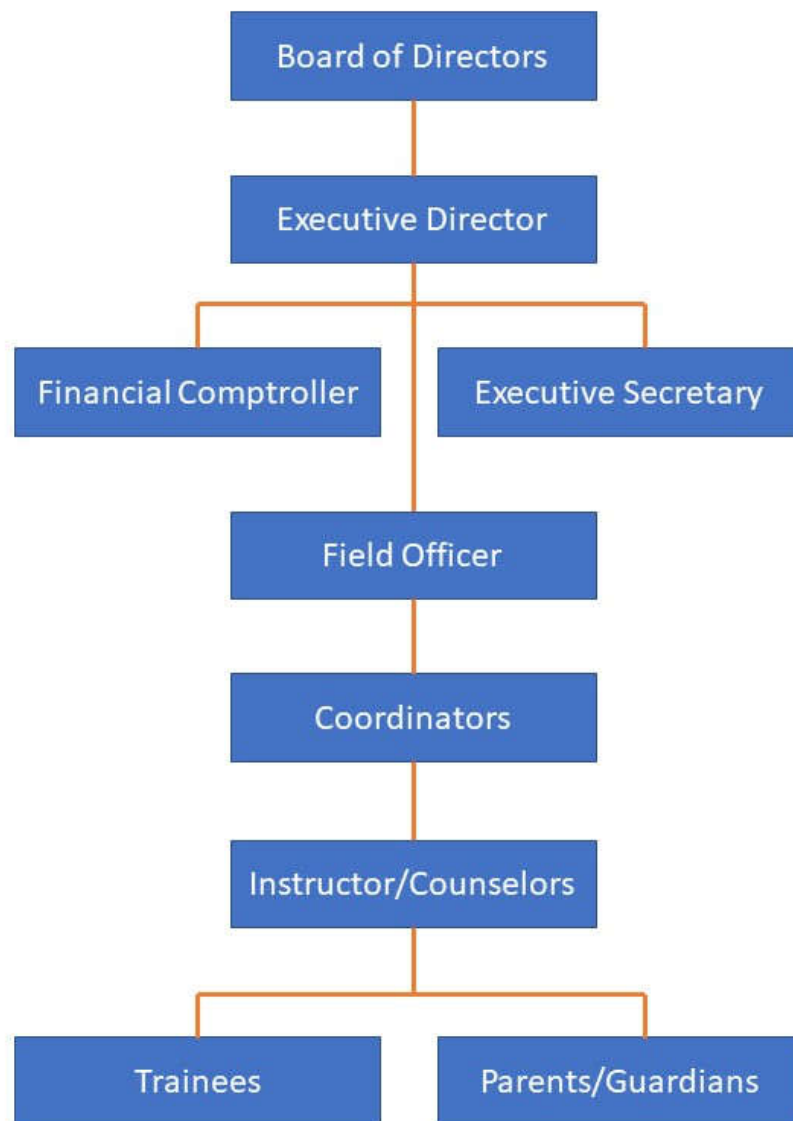
To become the leading provider of training for at-risk youth in an environment which is supportive, challenging and technologically sound (CARE, 2022-2023)

2.1.3 Organizational structure

In the Organizational Structure, the Executive Director reports to the Board of Directors, but is also the only non-elected member of the Board. Further, due to some departures, including the untimely death of one of the staff during the pandemic, the positions of Financial Comptroller and Field Officer are currently absorbed into those of the Executive Secretary and Coordinators, respectively. This is currently a temporary solution.

Figure 1 indicates the present organizational structure of the institution.

**Figure 1- Organizational Structure Center for Adolescent Renewal and Education,
Saint Lucia West Indies**



Note. From (The CARE Programme, 2022-2023)

2.1.4 Products offered.

In accordance with the National Council on Technical and Vocational Education and Training (NCTVET) standards, CARE offers Certified Technical Education and Vocational Training (TVET) in the following areas:

- **Auto Mechanics**

Theory and training in the key areas of the automotive trade including suspension and steering, wheel alignment and wheel balancing, manual and automatic suspension, tune-up, and engine repairs.

- **Carpentry / Joinery**

Theory and training in a workshop in the use of timber products for fabrication of furniture and cabinet building and creating and installing building components.

- **Catering and Hospitality**

Theory and training in food preparation and etiquette using traditional and modern methods in the field of culinary arts.

Electrical Installation

Theoretical studies and hands-on training in Basic and Intermediate levels of electrical wiring, circuitry, and installations.

- **Airconditioning / Refrigeration**

Theory and practice in the acquisition of knowledge in maintenance, installation and servicing of air-conditioning and refrigeration systems.

- **Manufacturing Sewn Products**

Theory and practice in garment fabrication, basic sewing and cutting skills, drafting patterns, reading measurements, hemming, stitching and manufacturing, the application of a combination of techniques and use of equipment.

Construction Trades

Theory and practice in the areas of plumbing, tiling, masonry, building products fixing, finishes and fittings.

Computer / Office Skills

Theory and practice in fundamental computer competencies, software office etiquette (manage databases, send emails, create spreadsheets, understand memory, and network limitations) and function and features of modern computer components.

2.2 Project Management Concepts

This section seeks to identify the main project management concepts (project, project management, project life cycle, knowledge areas, project management processes, process groups) and any other applicable related concepts that will assist in defining relationship of these concepts with the areas to be considered for the development of a Project Management Plan for the design and construction of a Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia, as well as with the company/enterprise context.

Project

A project is a temporary undertaking to create a definitive product, service, or result. It must have a start and end date. A project is undertaken to fulfill objectives by producing deliverables. A deliverable is defined as a unique and verifiable product, result, or capacity to perform a service that is required to be produced to complete a process, phase, or project (PMBOK®Guide, A guide to Project Management Book of Knowledge, 2017).

2.2.1 Project Management Principles

Principles for a profession serve as foundational guidelines for strategy, decision making and problem solving. Professional standards and methodologies are often based on principles. The principles of project management are not prescriptive in nature (it does not dictate how people or things should function). They are intended to guide the behavior of people involved in projects. The *PMI Code of Ethics and Professional Conduct* [2] is based on four values that were identified as most important to the project management community. These four (4) values are:

- Responsibility
- Respect
- Fairness, and
- Honesty.

The Twelve (12) principles of project management are aligned with the values identified in the *PMI Code of Ethics and Professional Conduct*. They do not follow the same format, as the four values and they are not duplicative; rather, the

principles and *Code of Ethics* are complementary (PMBOK®Guide, 7th edition, 2021, p. 21).

The Twelve (12) Principles can be depicted as follows:

- Be diligent, respectful, and caring steward.
- Create a collaborative project team environment.
- Effectively engage with stakeholders.
- Focus on value.
- Recognize, evaluate, and respond to systems interactions.
- Demonstrate leadership behaviors.
- Tailor based on context.
- Build quality into processes and deliverables.
- Navigate complexity.
- Optimize risk responses.
- Embrace adaptability and resiliency.
- Enable change to achieve the envisioned future state.

Extracted from PMBOK®Guide, 7th edition (2021, pp. 24-59).

For the purpose of this research project, all twelve principles would apply in varying capacities and operationalizing them would need to occur through verbal and written communication in an effort to keep project team and steering committee members aligned and always alert to behavioral expectancies and rules governing

the project management principles throughout the life cycle of the design and construction phase of the project.

2.2.2 Project Management Performance Domains

A project performance domain is a group of related activities that are critical for the effective delivery of project outcomes. Project performance domains are interactive, interrelated, and interdependent areas of focus that work in unison to achieve desired project outcomes.

There are eight (8) project performance domains:

- Stakeholders
- Team
- Development Approach and Life Cycle
- Planning
- Project Work
- Delivery
- Measurement and
- Uncertainty

Together the performance domains form a unified whole and operate as an integrated system, with each performance being interdependent on the other performance domains to enable successful delivery of the project and its intended outcomes. Performance domains run concurrently throughout the project, regardless

of how value is delivered regardless of whether the value is delivered frequently, periodically or at the end of the project, (PMBOK®Guide, 7th edition, 2021, p. 7).

Relationship of Project Performance Domains to Design and Construction of the Center for Adolescent Renewal and Education:

2.2.2.1 Stakeholder Performance Domain

This performance domain entails working with stakeholders to maintain alignment and engagement with them to foster positive relationships and satisfaction (PMBOK®Guide, 7th edition, 2021).

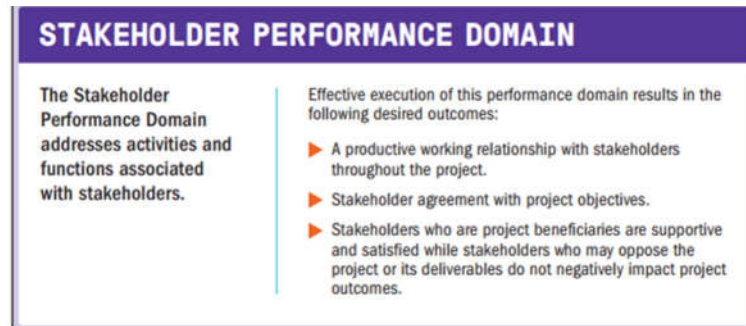
Definitions relevant to domain according to PMBOK®Guide, 7th edition, 2021,p. 8:

Stakeholder- An individual, group, or organization that may affect, be affected, or perceive itself to be affected by a decision, activity, or outcome of a project, program, or portfolio. Their influence, power, or interests may change as the project unfolds.

Stakeholder Analysis- A method of systematically gathering and analyzing quantitative and qualitative information to determine whose interest should be considered throughout the project.

Figure 2, Below depicts the outcomes of executing stakeholder performance domain.

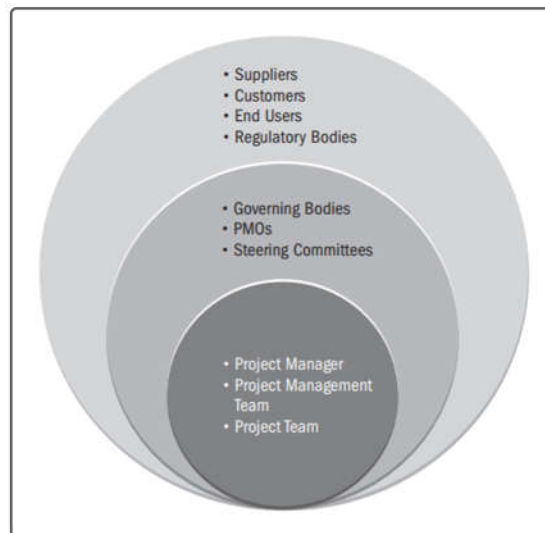
Figure 2 Stakeholder Performance Domain



Note. From Stakeholder Performance Domain PMBOK®Guide, 7th edition, p.8. Copyright 2021 by PMI.

Figure 3, Below depicts a sample list of project stakeholders.

Figure 3: Example of Project Stakeholders



Note. From Stakeholder Performance Domain PMBOK®Guide, 7th edition, p.9. Copyright 2021 by PMI.

2.2.2.2 Team Performance Domain

This performance domain entails establishing the culture and environment that enables a collection of diverse individuals to evolve into a high-performing project team. This includes recognizing the activities needed to foster project team development and encouraging leadership behaviors from all team members (PMBOK®Guide, 7th edition, 2021).

Definitions relevant to domain according to PMBOK®Guide, 7th edition, 2021, p. 16:

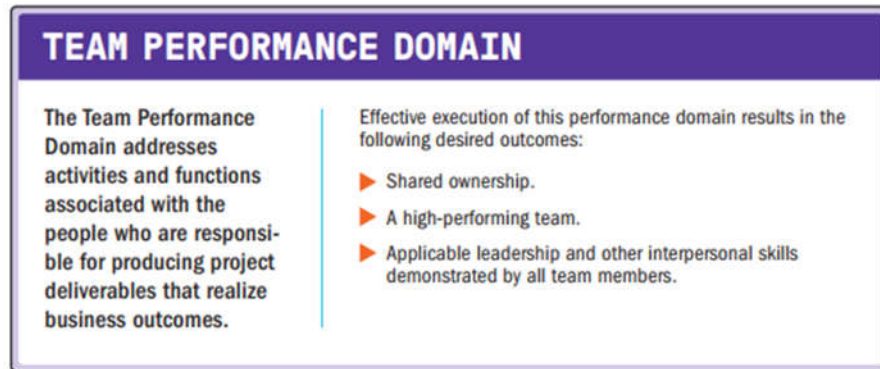
Project Manager- person assigned by the performing organization to lead the project team that is responsible for achieving the project objectives.

Project Management Team- The members of the project team who are directly involved in project management activities.

Project Team- A set of individuals performing the work of the project to achieve its objectives.

Figure 4, Below depicts the outcomes of executing Team performance domain.

Figure 4: Team Performance Domain



Note. From Team Performance Domain PMBOK®Guide, 7th edition, p.16. Copyright 2021 by PMI.

2.2.2.3 Development Approach and Life Cycle Performance Domain

This performance domain entails establishing the development approach, delivery cadence, and project life cycle needed to optimize project outcomes (PMI, PMBOK®Guide, 7th edition, 2021).

Definitions Relevant to Domain according to PMBOK®Guide, 7th edition, 2021:

Deliverable- Any unique and verifiable product, result, or capability to perform a service that is required to be produced to complete a process, phase, or project.

Development Approach- A method used to create and evolve the product, service, or result during the project life cycle, such as a predictive, iterative, incremental, adaptive or hybrid method.

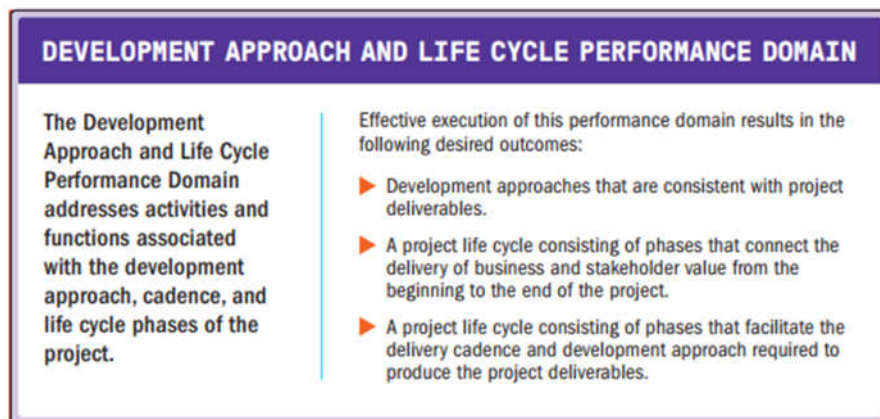
Cadence- A rhythm of activities conducted throughout the project.

Project Phase- A collection of logically related project activities that culminates in the completion of one or more deliverables.

Project Life Cycle- The series of phases that a project passes through from its start to its completion.

Figure 5, Below depicts the outcomes of executing Develop Approach Life Cycle Domain.

Figure 5 : Development Approach and Life Cycle Performance Domain



Note. From Development Approach and Life Cycle Performance Domain, PMBOK®Guide, 7th edition, p.32. Copyright 2021 by PMI.

2.2.2.4 Planning Performance Domain

This performance domain organizes, elaborates, and coordinates project work throughout the project. Its purpose is to proactively develop an approach to create the project deliverables

(PMBOK®Guide, 7th edition, 2021).

Definitions relevant to domain according to PMBOK®Guide, 7th edition, 2021:

Estimate- A quantitative assessment of the likely amount or outcome of a variable, such as project costs, resources, effort, or durations.

Accuracy- Within the quality management system, accuracy is an assessment of correctness.

Precision- Within the quality management systems, precision is an assessment of exactness.

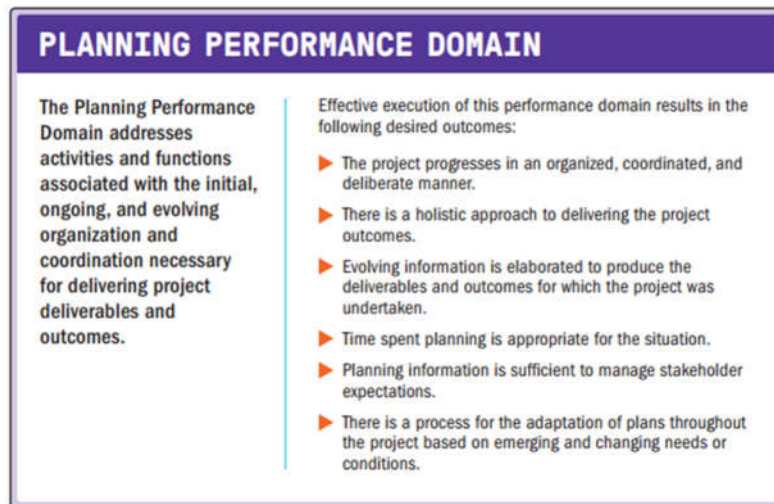
Crashing- A method used to shorten the schedule duration for the least incremental cost by adding resources.

Fast Tracking- A schedule compression method in which activities or phases normally done in sequence are performed in parallel for at least a portion of their duration.

Budget- The approved estimate for the project or any work breakdown structure (WBS) components or any schedule activity.

Figure 5, Below depicts the outcomes of executing planning Performance Domain.

Figure 6 : Planning Performance Domain



Note. From Planning Performance Domains PMBOK®Guide, 7th edition, p.51. Copyright 2021 by PMI.

2.2.2.5 Project Work Performance Domain

This performance domain is associated with establishing the processes and performing the work to enable the project team to deliver the expected deliverables and outcomes (PMBOK®Guide, 7th edition, 2021).

Definitions relevant to domain according to PMBOK®Guide, 7th edition, 2021:

Bid Documents- All documents used to solicit information, quotations, or proposals from prospective sellers.

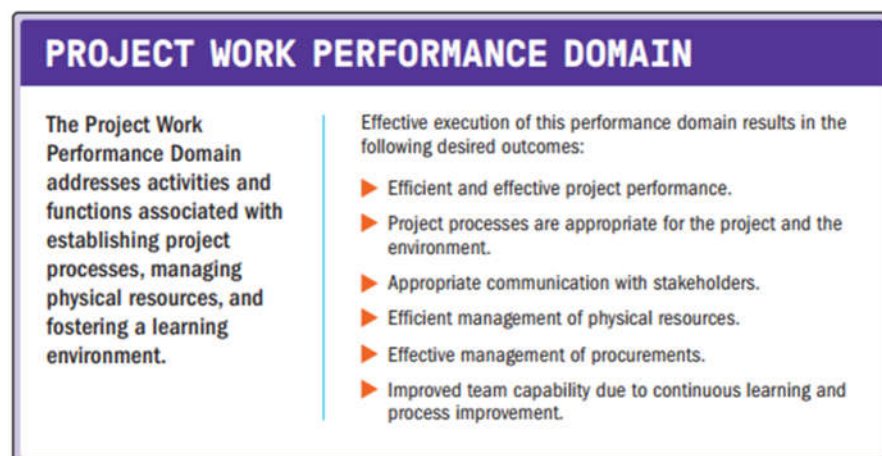
Bidder Conference- The meetings with prospective sellers prior to the preparation of a bid or proposal to ensure all prospective vendors have a clear and common understanding of the procurement. Also known as contractor conferences, or Prebid conferences.

Explicit knowledge- Knowledge that can be codified using symbols such as words, numbers, and pictures.

Tacit Knowledge- Personal knowledge that can be difficult to articulate and share such as beliefs, experience, and insights.

Figure 7, Below depicts the outcomes of executing Project Work Performance Domain.

Figure 7 : Project Work Performance Domain



Note. From Project Work Performance Domain, PMBOK®Guide, 7th edition, p.69. Copyright 2021 by PMI.

2.2.2.6 Delivery Performance Domain

This performance domain emphasizes project support strategy, execution, and the advancement of business objectives. Project delivery focuses on meeting requirements, scope, and quality expectations to produce the expected deliverables that will drive the intended outcomes. Projects provide business value by developing new products or services, solving problems, or fixing features that were defective or suboptimal. Projects often deliver multiple outcomes that stakeholders may value differently (PMBOK®Guide, 7th edition, 2021, p. 80).

Definitions relevant to domain according to PMBOK®Guide, 7th edition, 2021:

Requirement- A condition or capability that is necessary to be present in a product, service, or result to satisfy a business need.

Work Breakdown Structure (WBS)- A hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables.

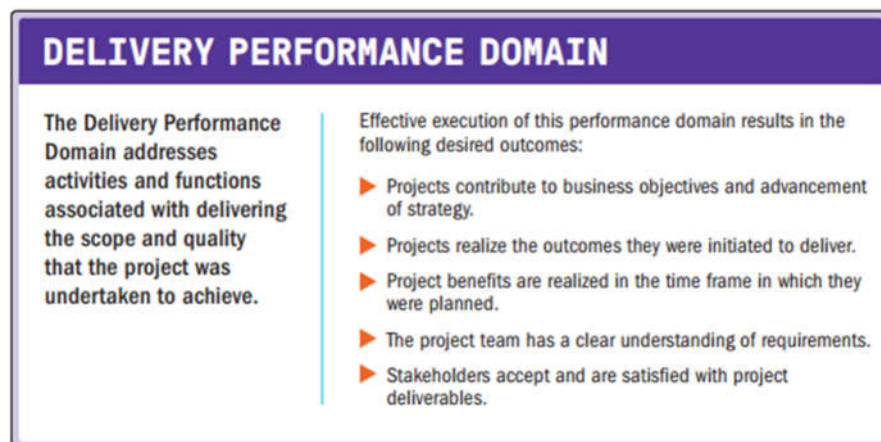
Definition of Done (DoD)- A checklist of all the criteria required to be met so that a deliverable can be considered ready for customer use.

Quality- The degree to which a set of inherent characteristics fulfills requirements.

Cost of Quality (COQ)- All costs incurred over the life of the product by investment in preventing nonconformance to requirements, appraisals of the product or service for conformance to requirements, and failure to meet requirements.

Figure 8, Below depicts the outcomes of executing Delivery Performance Domain.

Figure 8 : Delivery Performance Domain



Note. From Delivery Performance Domain, PMBOK®Guide, 7th edition, p.80. Copyright 2021 by PMI.

2.2.2.7 Measurement Performance Domain

This performance domain involves assessing project performance and implementing appropriate responses to maintain optimal performance. It evaluates the degree to which the work done in the delivery performance domain is meeting the metrics identified in the planning performance domain (PMBOK®Guide, 7th edition, 2021).

Definitions relevant to domain according to PMBOK®Guide, 7th edition, 2021, p.93:

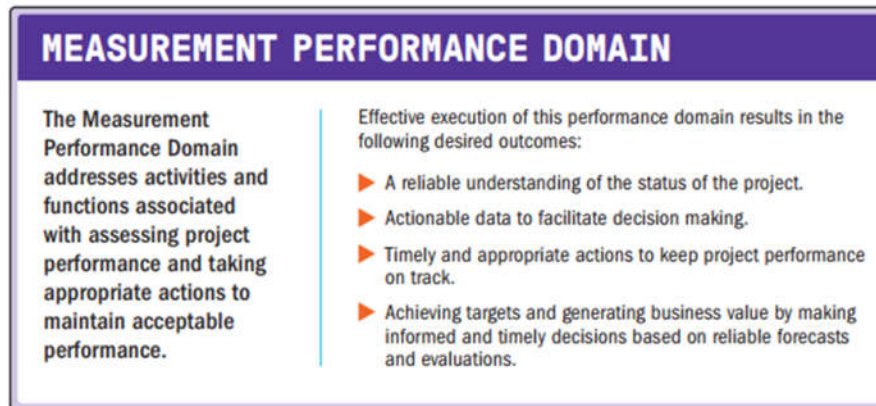
Metric- A description of a project or product attribute and how to measure it.

Baseline-The approval version of a work product used as a basis for comparison to actual results.

Dashboard- A set of charts and graphs showing progress or performance against important measures of the project.

Figure 9, Below depicts the outcomes of executing Measurement Performance Domain.

Figure 9 : Measurement Performance Domain



Note. From Measurement Performance Domain, PMBOK®Guide, 7th edition, p.93. Copyright 2021 by PMI.

2.2.2.8 Uncertainty Performance Domain

In this performance domain projects exist in environments with varying degrees of uncertainty. Uncertainty presents threats and opportunities that project teams explore, assess, and decide how to handle. Uncertainty in the broadest sense is a state of knowing or unpredictability (PMBOK®Guide, 7th edition, 2021).

Definitions relevant to domain according to PMBOK®Guide, 7th edition, 2021, p.117:

Uncertainty- A lack of understanding and awareness of issues events, paths to follow, or solution to pursue.

Ambiguity- A state of being unclear, having difficulty in identifying the cause of events, or having options from which to choose.

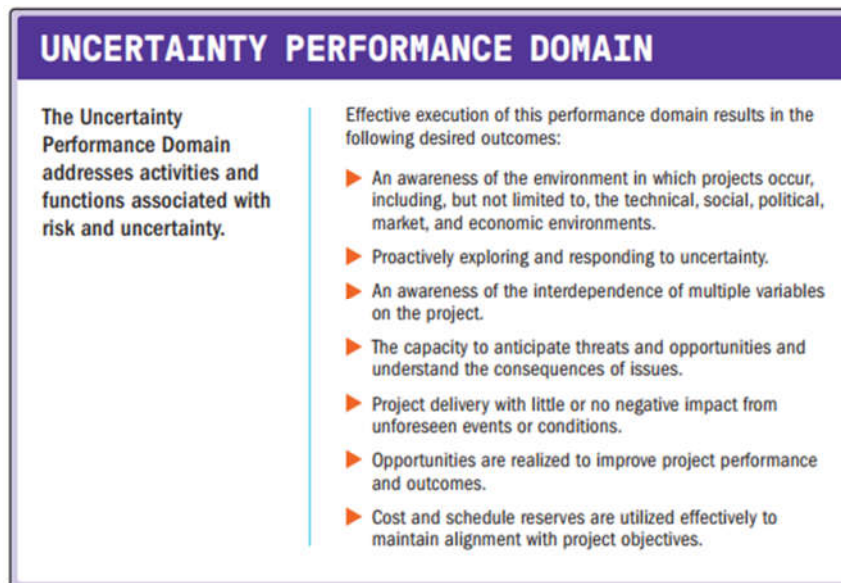
Complexity- A characteristic of a program or project or its environment that is difficult to manage due to human behavior, system behavior, and ambiguity.

Volatility- The possibility for rapid and unpredictable change.

Risk- An uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.

Figure 9, Below depicts the outcomes of executing Uncertainty Performance Domain.

Figure 10 : Uncertainty Performance Domain

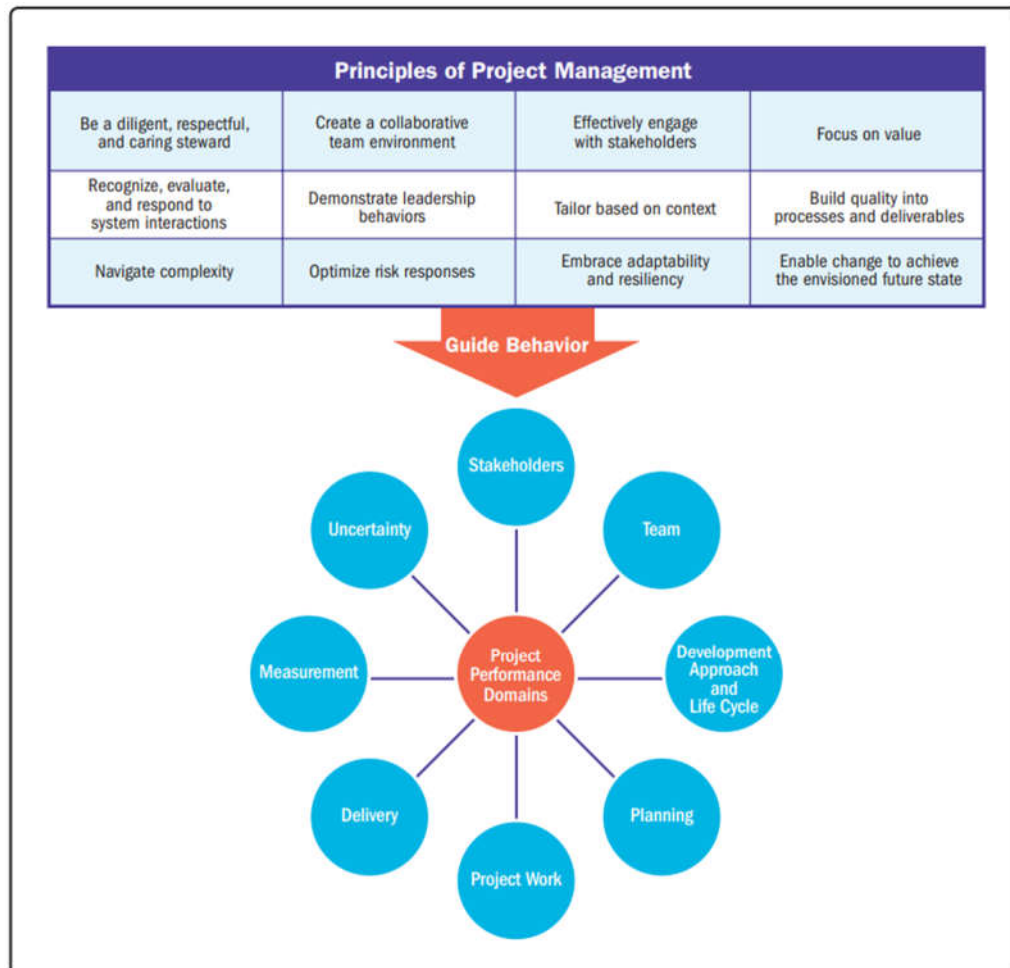


Note. From Uncertainty Performance Domain, PMBOK®Guide, 7th edition, p.116. Copyright 2021 by PMI.

2.2.3 Relationship between Project Management Principles and Project Management Domains.

The principles for project management provide guidance for the behavior of people involved in projects as they influence and shape the performance domains to produce the intended outcomes, i.e., principles guide behavior while the performance domains present broad areas of focus in which to demonstrate that behavior. See Figure 11 below.

Figure 11 : Relationship between Project Management Principles and Project Performance Domains



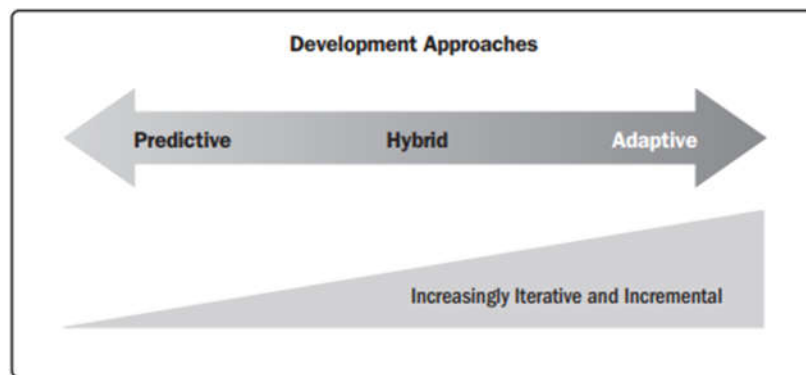
Note. From Tailoring the Performance Domains, PMBOK®Guide, 7th edition, p.146. Copyright 2021 by PMI.

2.2.4 Predictive, Adaptive and Hybrid Projects

Development Approach

A development approach is the means used to create and evolve the product, service, or result during the project life cycle. Three commonly used approaches are Predictive, Adaptive, and Hybrid. These approaches are often viewed as a spectrum, from the predictive approach on one end of the spectrum, to the adaptive on the other end (PMBOK®Guide, 7th edition, 2021, p. 35). See Figure 12 below.

Figure 12 : Development Approaches



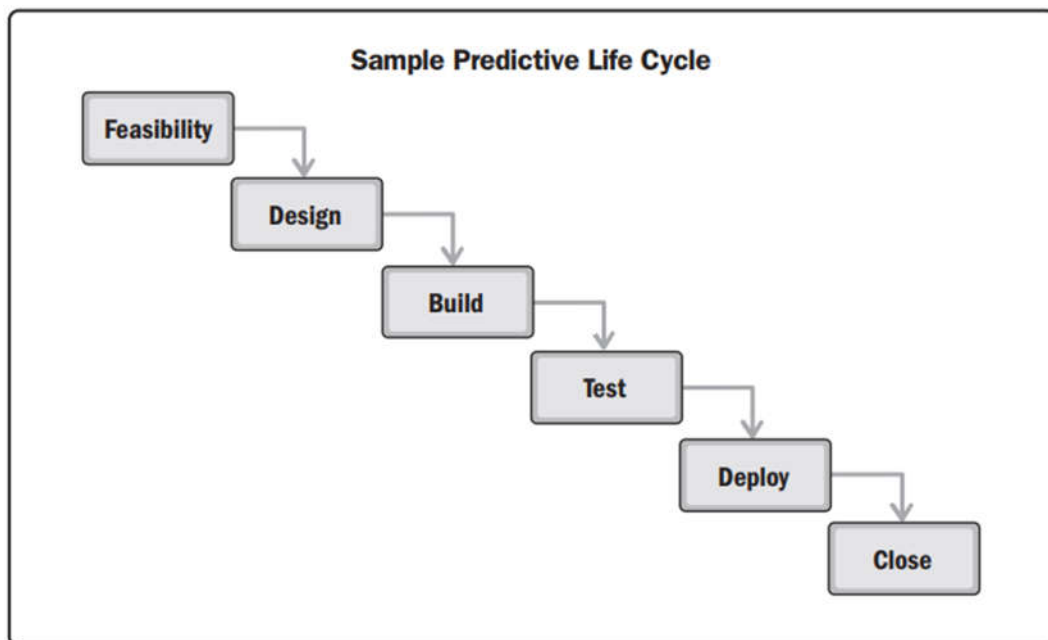
Note. From Project Performance Domains, Development Approaches, PMBOK®Guide 7th edition, p.35. Copyright 2021 by PMI.

Predictive Approach

A predictive approach is useful when the project and product requirements can be defined, collected, and analyzed at the start of the project. This approach may also be used when there is a significant investment involved and a high level of risk that may require frequent reviews, change control mechanisms and replanning between

development phases. The scope, schedule, cost, resource needs, and risks can be well defined in the early phases of the project life cycle and are relatively stable. It allows the project team to reduce the level of uncertainty early in the project and planning is done upfront. Such an approach may use proof-of-concept developments to explore options, but the majority of project work follows the plans that were developed near the start of the project. Projects using this approach usually have templates from previous, similar projects (PMI, PMBOK®Guide, 7th edition, 2021, p. 35). See Figure 13 below.

Figure 13 : Predictive Life Cycle

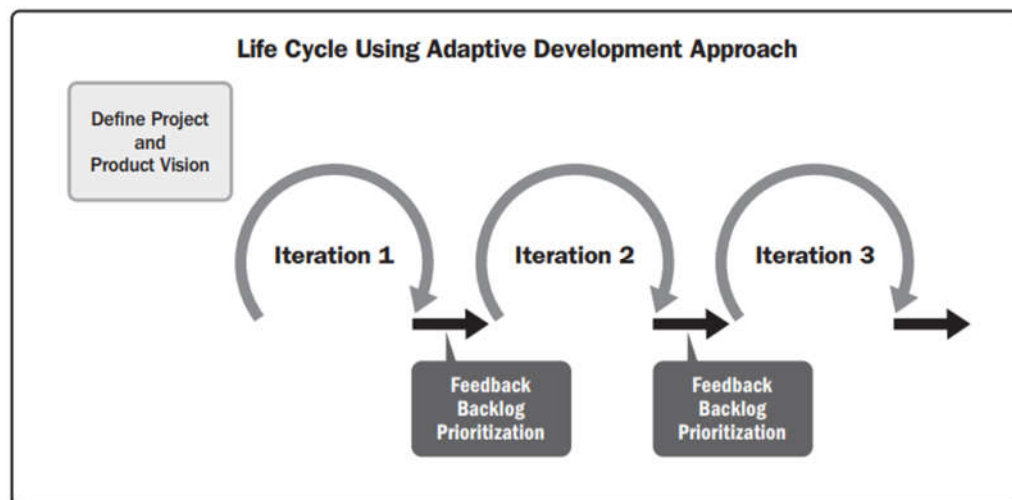


Note. From Project Performance Domains, Development Approaches, PMBOK®Guide 7th edition, p.43. Copyright 2021 by PMI.

Adaptive Approach

Adaptive approaches are useful when requirements are subject to a high level of uncertainty and volatility and are likely to change throughout the project. A clear vision is established at the start of the project, and the initial known requirements are refined, detailed, changed, or replaced in accordance with user feedback, the environment, or unexpected events. Such approaches use iterative and incremental approaches; however, the iterations tend to get shorter, and the product is more likely to evolve based on stakeholder feedback (PMI, PMBOK®Guide, 7th edition, 2021, p. 38). See Figure 14 below.

Figure 14 : Adaptive Development Approach

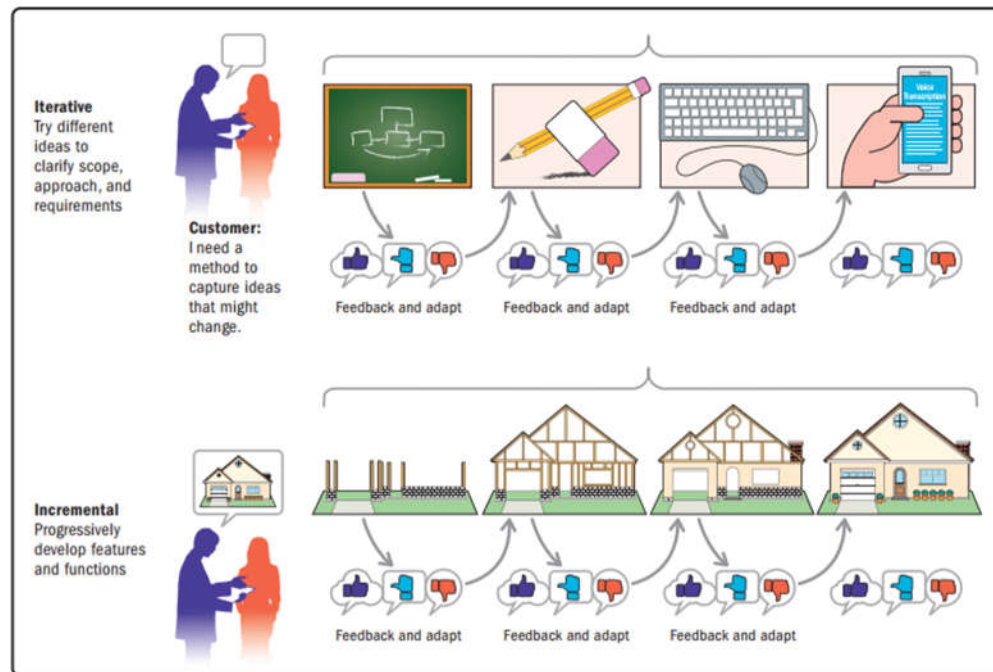


Note. From Project Performance Domains, Development Approaches, PMBOK®Guide 7th edition, p.45. Copyright 2021 by PMI.

Hybrid Approach

This approach is a combination of adaptive and predictive, meaning that some elements of both approaches are used. Such a development approach is useful when there is uncertainty or risk around the requirements. It is also useful when deliverables can be modularized, or when there are deliverables that can be developed by different project teams. Such an approach is more of an adaptive nature than a predictive approach but less so than a purely adaptive approach. Hybrid approaches often use an iterative or incremental development approach. An iterative approach is useful for clarifying requirements and investigating various options and may produce sufficient capability to be considered acceptable prior to final iteration. An incremental approach is used to produce a deliverable throughout a series of iterations, each of which adds functionality within a predetermined time frame (PMI, PMBOK®Guide, 7th edition, 2021, p. 36). See Figure 15 below.

Figure 15 Hybrid Iterative and Incremental Development



Note. From Project Performance Domains, Development Approaches, PMBOK®Guide 7th edition, p.37. Copyright 2021 by PMI.

For the purpose of this research project a predictive approach is the most suitably related development approach because there is significant investment involved from a donna agency and a high level of risk that may require frequent reviews, change control mechanisms and replanning between development phases.

2.2.5 Project Management

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. It is accomplished through the appropriate application and integration of the project management processes

identified for the project and enables organizations to execute projects effectively and efficiently. It can involve a one-time project or an ongoing activity, and the resources managed include personnel, finances, technology, and intellectual property. From start to finish, every project needs a plan that outlines how things will get off the ground, how they will be built and how they will finish.

Effective project management helps individuals, groups, and public and private organizations to:

- Meet business objectives.
- Satisfy stakeholder expectations.
- Be more predictable.
- Increase chances of success.
- Deliver the right products at the right time.
- Resolve problems and issues.
- Respond to risks in a timely manner.
- Optimize the use of organizational resources.
- Identify, recover, or terminate failing projects.
- Manage constraints (e.g., scope, quality, schedule, costs, resources).
- Balance the influence of constraints on the project.
- Manage change in a better manner.

Extracted from PMBOK®Guide, 2017, p. 10

2.2.6 Project Management Knowledge Areas and Processes

Project management knowledge areas are fields or specialized areas defined by their knowledge requirements and described in relation to their component processes, practices, input, outputs, tools, and techniques utilized when managing projects. The ten knowledge areas will be used to develop the project management for the design and construction of the Center for Adolescent Renewal and Education.

The ten knowledge areas of project management according to PMBOK®Guide, 2017 are as follows:

1. Project Integration Management
2. Project Scope Management
3. Project Schedule / Time Management
4. Project Cost Management
5. Project Quality Management
6. Project Resource Management
7. Project Communication Management
8. Project Risk Management
9. Project Procurement Management
10. Project Stakeholder Management

2.2.6.1 Project Integration Management

Includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the project management process groups and includes:

- Develop Project Charter
- Develop Project Management Plan
- Direct and Manage Project Execution
- Manage Project Knowledge
- Monitor and Control Project Work
- Close Project or Phase.

2.2.6.2 Project Scope Management

Includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project and includes:

- Collect Requirements
- Define Scope
- Create WBS
- Validate Scope
- Control Scope.

2.2.6.3 Project Schedule/Time Management

Includes the processes required to manage the timely completion of the project and includes:

- Plan Schedule Management
- Define Activities
- Sequence Activities
- Estimate Activity Durations
- Develop Schedule
- Control Schedule.

2.2.6.4 Project Cost Management

Includes the processes involved in the planning, estimating, budgeting, financing, funding, managing, and controlling of the project and product quality requirements, in order to meet stakeholders' expectations and includes:

- Plan Cost Management
- Estimate Costs
- Determine Budget
- Control Cost.

2.2.6.5 Project Quality Management

Includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling of the project and product quality requirements, in order to meet stakeholders' expectations and includes:

- Plan Quality Management
- Manage Quality Assurance
- Quality Control.

2.2.6.6 Project Resource Management

Includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project and includes:

- Plan Resource Management
- Estimate Activity Resources
- Acquire Resources
- Develop Team
- Manage Team
- Control Resources

2.2.6.7 Project Communications Management

Includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project information. This includes but is not limited to:

- Plan Communications Management
- Management Communications
- Monitor Communications

2.2.6.8 Project Risk Management

Includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project. This includes but is not limited to:

- Plan Risk Management
- Identify Risks
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Plan Risk Responses
- Implement Risk Responses
- Monitor Risks.

2.2.6.9 Project Procurement Management

Includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team. This includes but is not limited to:

- Plan Procurement Management
- Conduct Procurements
- Control Procurements

2.2.6.10 Project Stakeholder Management

Includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate

management strategies for effectively engaging stakeholders in project decisions and execution. This includes but is not limited to:

- Identify stakeholders.
- Plan Stakeholder engagement
- Manage Stakeholder engagement.
- Monitor Stakeholder engagement.

2.2.7 Project management Processes

A project Management Process can be defined as a series of project management activities producing one or more outputs from one or more inputs by using appropriate project management tools and techniques. They are logically linked by such outputs and may contain overlapping activities that occur throughout the project.

2.2.7.1 Project Management Process Groups

This is a logical grouping of project management processes to achieve specific project objectives and are independent of project phases.

The Project Management processes according to PMBOK®Guide, 2017 are grouped into five Project Management Process Groups as follows:

- **Initiating Process Group-** This includes the process(es) performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase.

- **Planning Process Group-** This includes the process(es) required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve.
- **Executing Process Group-** This includes the process(es) performed to complete the work defined in the project management plan to satisfy the project requirements.
- **Monitoring and controlling Process Group-** This includes the process(es) required to track, review, and regulate the processes and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes.
 - **Closing Process Group-** This includes the process(es) performed to formally complete or close a project, Phase or Contract. Please See Figure 16 below

Figure 16 : Project Management Process Groups and Knowledge Area

Mapping

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	4.7 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Schedule Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule		6.6 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Manage Quality	8.3 Control Quality	
9. Project Resource Management		9.1 Plan Resource Management 9.2 Estimate Activity Resources	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	9.6 Control Resources	
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Monitor Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses	11.6 Implement Risk Responses	11.7 Monitor Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Engagement	13.3 Manage Stakeholder Engagement	13.4 Monitor Stakeholder Engagement	

Note. From Project Management Process Groups, PMBOK®Guide 6th edition, p.556. Copyright 2017 by PMI.

2.2.8 Project life cycle

A project life cycle is the series of phases that a project passes through from its initiation to its closure (PMI, PMBOK®Guide, 7th edition, 2021, p. 245). It is essential during the early stages of the project to determine the life cycle that is best suited for your project.

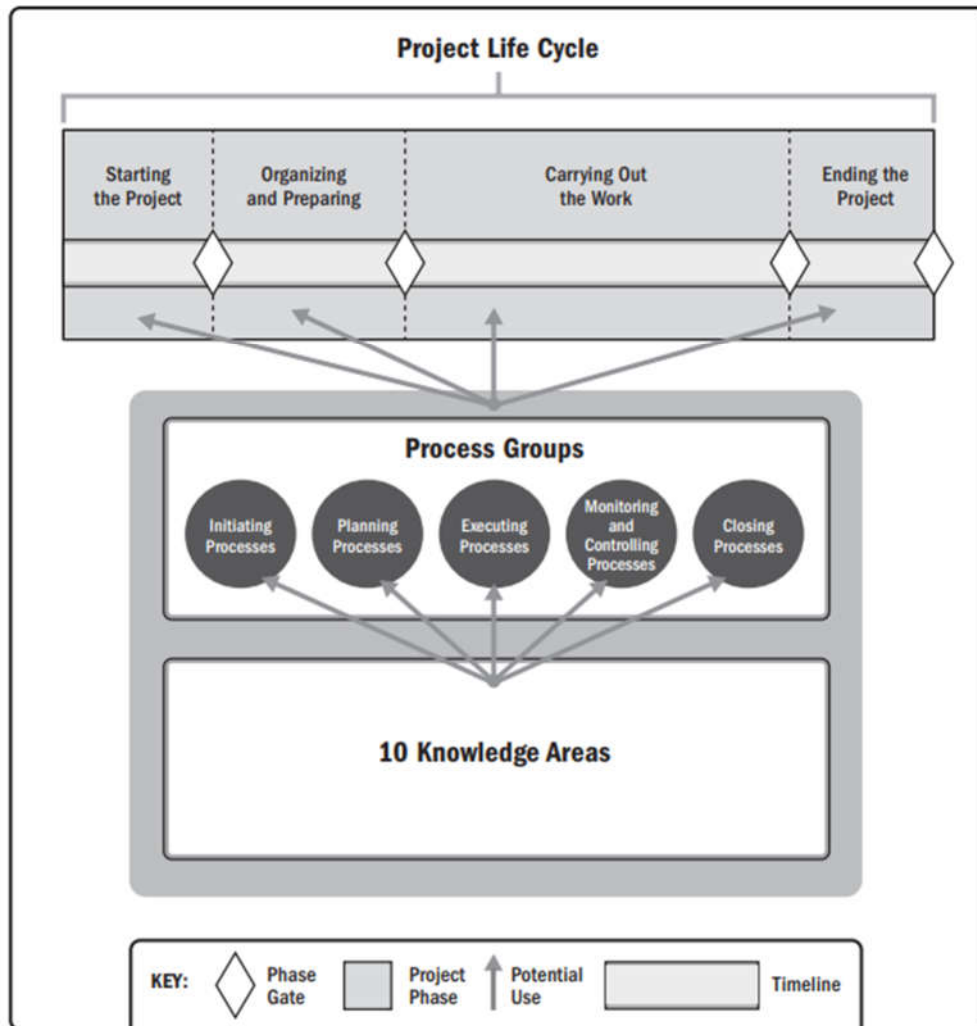
Although projects are unique and highly unpredictable, their standard framework consists of the same generic lifecycle structure, consisting of the following phases:

- The initiation phase.
- The planning phase.
- The execution phase.
- The monitoring and controlling Phase.
- The closing Phase.

For the purpose of this research project the five phases of a project's life cycle will comply.

Please See Figure 17 below.

Figure 17 :Project Management Life Cycle



Note. From Introduction- Project and Development Life Cycles, PMBOK®Guide 6th edition, p.18-19. Copyright 2017 by PMI.

2.2.9 Company strategy, portfolios, programs, and projects

The programme is implemented in two phases. Phase 1 is referred to as the Adolescent Development Programme (A.D.P.) and Phase 2 is referred to as the Skills Programme. Together these phases can be completed in two – three years.

Phase 1:

The Adolescent Development Programme (A.D.P.)

The A.D.P. is designed to help the young people develop as a “whole” person spiritually, physically, intellectually, creatively, emotionally, and socially. It is often referred to as the S.P.I.C.E.S. programme which aims at the total development of the individual through a variety of activities. Core subject areas include:

- Self-awareness
- Spirituality
- Parenting
- Language Arts
- Mathematics
- Public Speaking
- Social Studies

Phase 2:**The Skills Programme**

At the end of the one-year Adolescent Development Programme, the young person is given the opportunity to receive at least one (1) year to two (2) years training in an income generating skill of his or her choice. The skills from which they choose currently are:

- Air Conditioning and Refrigeration
- Automotive Technology
- Carpentry and Joinery
- Catering and Hospitality
- Climate Smart Agriculture – Aquaponics
- Electrical Installation and Small Appliance Repair
- Garment Construction
- Office Skills

At the end of each year of this skills training period, the trainees engage in a six-week apprenticeship programme with local industry and business firms.

Upon programme completion, in addition to receiving a CARE Certificate of Completion, the trainees have the opportunity to receive a Caribbean Vocational Qualification (CVQ) certificate awarded by the Saint Lucia Technical Vocational and Education (TVET) Council as well as a Caribbean Certificate of Secondary Level Competence (CCSLC) awarded by the Caribbean Examination Council (CXC; CARE, 2022-2023).

2.3 Other Applicable Theory/Concepts related to the Project Topic and Context.

Culture and education can be seen as two principal interdependent parameters differentiating countries or societies. According to Yazd, (2020) in a society with a spiritual pattern of culture, the educational focus would be on the achievement of moral and eternal values of life. On the contrary, if the culture of a society is materialistic, then its educational pattern will be shaped for the attainment of materialistic values and comforts. A society which does not follow any culture definitely has no definite educational organization. The culture of a country, therefore, has a very powerful impact on its educational system. Today while human lives continue to live in local realities, the lives and experiences of youth growing up will be allied to social processes, economic realities, technological and media innovations, and cultural flows that go across international borders with ever greater momentum. These worldwide transformations will trigger the youth to adapt to new skills that are well ahead of what most educational systems can now distribute. The direct linkage between this theoretical analysis and project topic/concept encourages rethinking the approach to design and construction of educational buildings and the application of project management methodologies to achieve project success. The advantage of aligning local educational learning systems with international educational advancements provides unique opportunity to technological and innovative advancements for new skills development of the youth.

2.3.1 Current situation of the problem or opportunity in study

While the realization of educational projects has been fundamental to CARE and the Architectural Section (Design Architects) attached to government of Saint Lucia (GOSL), evidence of application of sound project management principles and practices were very superficial. Historically, projects run into many problems and shortcomings causing financial implications and inefficient use of funds. Currently there exists a lack of structure in project implementation from inception to completion. According to PMBOK®Guide, 7th edition (2021) the project management plan is a document that describes how the project will be executed, monitored, controlled, and closed. Hence the implementation of the same is essential to successful completion of the project by the company and or the implementing agency.

2.3.2 Previous research done for the topic in study.

Although some of the design architects had recently completed a basic training course in project management, in-depth theoretical and practical exercises to guide project management and implementation processes were not a part of the course outline. The intention in this FGP is to successfully develop the Project management plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.), and assess the projects end results using regenerative and or sustainable development. This would provide a suitable adaptive template useful for the implementation of future projects.

2.3.3 Other Theories related to the topic in study.

Saint Lucia is a tropical island and a member of the Organization of Eastern Caribbean States (OECS) and is located about 24 miles (39 km) south of Martinique and some 21 miles (34 km) northeast of Saint Vincent. The island is volcanic in nature and measures 616 square kilometers. It is a democratic state and a member of the British commonwealth.

This project “To develop the Project management plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.), stems out of the greater need to formalize and adequately structure design and construction projects realized by the Architectural Section, on behalf of the GOSL. The timely response and provision of critical information relating to project activities, workflows, and future projections for proposed ongoing works is useful to the state when conducting budgetary activities leading to financial allocation for ever new financial quarter. Managing the project allows for identification of requirements, establishment of clear and achievable objectives, adaptation to specifications, plans, balancing competing demands of quality, scope, cost, and time, and an approach to meet expectations of all key stakeholders including the client and the end-user.

The construction of a new Center for the Adolescent Renewal and Education (C.A.R.E.) will include the realization of the design and first phase of construction of the training institute to be built in Cul De Sac, Castries, St. Lucia. The building construction, inclusive of all preliminaries, is estimated to last a period of ten to twelve months. Project

sign-off will be performed by the Project Manager after all commissioning, approval of check, and final taking over certificate have been issued. Defects liability period as per contractual terms and conditions will commence immediately upon sign-off and the center will be ready for immediate operation thereafter. The first Phase of the project aims to design and construct an aesthetically pleasing, climate resilient and energy efficient facility, where marginalized youth and other individuals could access basic and intermediate TVET training. The catering and hospitality unit, a classroom to house 20 students, an administrative office, an electrical room, a network room, a guard hut, a driveway, and a parking lot will complement this phase. On average a total of twenty-five (25) staff members and one hundred and seventy (170) trainees are expected to utilize the facilities daily. The project team will leverage their expertise in construction management and will assist the project manager in all activities (quality management, resource scheduling, time and risk management, communication requirements, etc.)

A few theories related to realization of TVET learning and schools are:

According to literature three main learning theories are instrumental in the realization of TVET learning and the institutions that provide this learning. These theories include behaviorism, cognitivism, and constructivism.

- **Behaviorist Learning Theory**

According to Hassan (as cited in Rabinowitz, 2004) behaviorist learning theory emphasizes the role of the environment in determining behavior. Based on the tenets of this theory an event or activity in the environment will cause something to

happen in the mind, which then causes some behavior to occur (Flanagan, 1991; Rabinowitz, 2004). Hence, the instructional designer will use this theory by paying attention to the setting of the environment where events or activities take place, and possibly manipulate the consequences of different behavioral responses or teachers would present lesson objectives with some hints or cues in a linear fashion to lead students to a specific behavior and use effect to reinforce the specific behavior, (Rabinowitz, 2004).

- **Cognitive Learning Theory**

According to (Sink, 2014) as cited in (Aminuddin Hassan, 2019), Cognitive theory will assist the learner to obtain the thinking techniques in order to improve performance in the job, because the learning occurs based on how information is encoded, stored, and retrieved in the human memory (Foshay, Silber, & Stelnicki, 2003) and frequently follow Gagné's nine events of instruction. For example, findings from Hua's (2016) study reported a good level of program quality and achieved good performance on instruction, interactivity, and technique aspects that allow share approach to integrate information literacy within academic programmes, results in, a more effective technique to curriculum design, based on the ADDIE model. However, Hua's Study lacked cognitive load measurement techniques if it is to continue to be used as a framework for instructional design. In addition, the study lacked explanation about the constructs itself, resulting in validity and reliability issues; hence, the model may not be useful when tested in classrooms or real-world

scenarios.

- **Constructivist Learning Theory**

According to Aminuddin Hassan(2019), Constructivism is a learning theory that is concerned with the experiences and contexts that make the learners willing and enable to learn (McGriff, 2001). Constructivist learning design focuses on activities that allow for creating and recreating past experiences of students and the modification to new learning. Students are core matters, while teachers just act as facilitators (Botto, Schorr, & Lema 2006).

3 Methodological Framework

According to (Hassan, 2022), a methodological framework is a structure that can be used to organize research. It is composed of methods and concepts that are related to a particular field of study. The framework provides a guide for the research, so that it can be conducted in a systematic and efficient manner. The purpose of a methodological framework is to provide guidance for researchers conducting a study, and it can be used to determine what data needs to be collected and how it should be analyzed. The framework can also be used to assess the strengths and weaknesses of a study's methodology.

For the purpose of this research project emphasis is placed on the information sources, research methods, tools, assumptions, constraints, and deliverables in development of a project management plan for the design and construction of a Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia.

3.1 Information sources

According to (Oxford Learner's Dictionaries, 2023) a source is defined as “a person, book or document that provides information, especially for study, a piece of written work or news”. Information is defined as “knowledge communicated or received concerning a particular fact or circumstance” (Dictionary T. A., 2023). It can therefore be deduced or interpreted that information sources are any or all verbal or written channels (persons, documents, items, websites etc.) communicating knowledge or information relevant to a specific topic, outcome, or event, be it factual or fiction for the realization of a research or

general understanding. Information sources can be grouped into three categories namely Primary, Secondary and Tertiary. As part of this FGP all three named sources will be used.

3.1.1 Primary Sources

A **primary source** is a first-hand or contemporary account of an event or topic. These sources have not been modified by interpretation and offer original thought or new information. Primary sources are original materials, regardless of format.

Letters, diaries, minutes, photographs, artifacts, interviews, and sound or video recordings are examples of primary sources created as a time or event is occurring. Oral histories, newspaper or journal articles, and memoirs or autobiographies are examples of primary sources created after the event or time in question but offering first-hand accounts.

Primary sources may be transformed from their original format into a newer one, such as when materials are published or digitized, but the contents are still primary (University Libraries-SETON HALL UNIVERSITY, N.D.)

In this Project (Design and Construction of the Center for Adolescent Renewal and education) the primary information sources that will be used are:

- email communications,
- Steering committee meetings
- Project team meetings
- Building codes and other relevant Standards

- Project reports
- Personal meetings and video conferencing
- Photographs and interviews.

3.1.2 Secondary Sources

A **secondary source** is anything that describes, interprets, evaluates, or analyzes information from primary sources. They provide second-hand information and commentary from other researchers. Examples include journal articles, reviews, and academic books. Thus, secondary research describes, interprets, or synthesizes primary sources.

Secondary sources are good for gaining a full overview of your topic and understanding how other researchers have approached it. They often synthesize a large number of primary sources that would be difficult and time-consuming to gather by yourself. They allow you to:

- Gain background information on the topic.
- Support or contrast your arguments with other researchers' ideas.
- Gather information from primary sources that you cannot access directly (e.g., private letters or physical documents located elsewhere).

Both primary and secondary sources complement each other to help build a convincing argument. Primary sources are more credible as evidence, but secondary sources show how your work relates to existing research (Streefkerk, 2023).

As part of this Project (Design and Construction of the Center for Adolescent Renewal and education) the secondary sources that will be used are academic books, journals, and the internet and any other medium necessary.

Chart 1 Below depicts the Primary and secondary sources of information corresponding to the specific objectives.

Chart N0. 1 Information Sources (Source: Georges, L.B, Author, February 2023)

Objectives	Information sources	
	Primary	Secondary
1. To create a Project Charter that authorizes the project and documents the objectives, goals, and business case of the project.	<ul style="list-style-type: none"> Steering Committee meetings. zoom (video conference) meetings with key stakeholders from C.A.R.E., TVET, ILO, The Project Architect (Department of Physical Development and Urban Renewal) and the Ministry of Education. 	<ul style="list-style-type: none"> PMBOK® Guide Sixth & Seventh edition. Internet CARE website.
2. To create an Integration Management Plan that	<ul style="list-style-type: none"> Stakeholder meetings 	<ul style="list-style-type: none"> PMBOK®Guide Sixth & Seventh edition.

Objectives	Information sources	
	Primary	Secondary
ensures all project work processes and activities run efficiently in a coordinated manner for timely completion of project and within budget.	<ul style="list-style-type: none"> • Communication via telephone, zoom, conference calls, and emails. 	<ul style="list-style-type: none"> • Internet • PMI Database.
3. To create a Scope Management Plan which ensure all project activities are realized within a set structure that enables documenting, monitoring and control of project resources which are required to achieve project objectives and success.	<ul style="list-style-type: none"> • Project Team meetings • Design team Meetings • zoom meetings (video conference) with key stakeholders. • Steering committee meetings. 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition, • Internet • PMI Database • Similar projects from documentation center UCI
4. To create a Schedule / Time Management Plan which seeks to ensure the prioritization of planned project activities and their achievement or realization within stipulated time frames, for greater productivity and efficiency.	<ul style="list-style-type: none"> • Zoom meetings (video conference) with key stakeholders. • Project and steering committee meetings. 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition, • Internet • PMI Database. • Similar projects from documentation center UCI
5. To develop a Cost Management Plan for managing and controlling overall costs aligned to resources and project activities in relation to the	<ul style="list-style-type: none"> • Personal meetings with financial analyst, Department of Physical Development and Urban Renewal. 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition, • Internet • PMI Database.

Objectives	Information sources	
	Primary	Secondary
cost baseline and ensuring they are kept within budget limits.	<ul style="list-style-type: none"> • key stakeholder Meetings • Project Meetings with Project Architect and Quantity Surveyor. 	<ul style="list-style-type: none"> • Similar projects from documentation center UCI
6. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality that adheres to quality standards and project objectives throughout the project's life cycle.	<ul style="list-style-type: none"> • Project implementation team meetings. • Organization of Eastern Caribbean States (O.E.C.S) building codes. • National Fire Alarm and Signaling Code® (NFPA 72®) Standards. 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition • Internet • PMI Database
7. To develop a Resource Management Plan to assist in optimizing resource availability and use, by identifying, quantifying, acquiring, and managing the resources required for the project's successful completion.	<ul style="list-style-type: none"> • Project and Design team meetings. • Project steering committee meetings. • Personal meeting with financial analyst for the Department of Physical Development and Urban Renewal. 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition • Internet
8. To create a Communications Management Plan to serve as a framework that guides, outlines, and details communication needs and expectations to meet project deliverables	<ul style="list-style-type: none"> • Personal and zoom (video conference) meeting with key stakeholders. • Personal meeting with financial analyst for the Department of Physical Development and Urban Renewal. 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition.

Objectives	Information sources	
	Primary	Secondary
throughout the life of the project.	<ul style="list-style-type: none"> • Project Steering committee meetings. 	
9. To develop a Risk Management Plan which would assist in the proactive identification, monitoring, and analysis of internal or external situations that may arise and impact the project positively or negatively through its life cycle.	<ul style="list-style-type: none"> • Personal meetings with financial analyst, Department of Physical Development and Urban Renewal. • key stakeholder Meetings • Project Meetings with Project Architect and Quantity Surveyor. 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition. • Internet.
10. To develop a Procurement Management Plan to define the methodological approach for managing the processes of obtaining goods and or services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project.	<ul style="list-style-type: none"> • Personal and zoom (video conference) meetings with key stakeholders from C.A.R.E., TVET, ILO, The Project Architect, Quantity Surveyor (Department of Physical Development and Urban Renewal) and the Ministry of Education. • Personal meeting with Director Procurement Unit, Ministry of Finance and Economic Development. 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition. • Internet • PMI Database. • Government of Saint Lucia Electronic Procurement Website.
11. To create a Stakeholder Management Plan that ensures the effective involvement, identification, control, and	<ul style="list-style-type: none"> • Personal and zoom (video conference) meeting with key stakeholders. • Personal Meeting with head management from the 	<ul style="list-style-type: none"> • PMBOK®Guide Sixth & Seventh edition. • Internet • PMI Database.

Objectives	Information sources	
	Primary	Secondary
categorization of stakeholders.	Department of Physical Development and Urban Renewal and the Ministry of Education	
12. To explain, using regenerative and sustainable development, the relationship and impact of the project execution and operation of the final product to establish which effects of the end results favor or disfavor regenerative or sustainable development.	<ul style="list-style-type: none"> Personal meetings with key stakeholders from C.A.R.E., TVET, ILO, The Project Architect (Department of Physical Development and Urban Renewal) and the Ministry of Education 	<ul style="list-style-type: none"> Book: Regenerative development, the way forward to saving our civilization. Internet. Journal articles.

3.2 Research Methods

The Oxford dictionary defines research as being: “The systematic investigation into and study of materials and sources in order to establish facts and reach new conclusions”. It also defines a method as: “A particular procedure for accomplishing or approaching something, especially a systematic or established one” (Oxford Dictionary, 2023).

Research methods are therefore “The strategies, processes or techniques utilized in the collection of data or evidence for analysis in order to uncover new information or create better understanding of a topic” (The University of Newcastle, 2023).

3.2.1 Analytical Research Method

Analytical Research is a form of research where the researcher has to make do with the data and factual information available at his or her behest and interpret this information to undertake an acute evaluation of the data.

This form of research is often undertaken by researchers to uncover some evidence that supports their present research, and which makes it more authentic. It is also undertaken for concocting fresh ideas relating to the topic on which the research is based.

Conducting meta-analysis, literary research, scientific trials and learning from public opinion are some of the methods through which analytical research is done (Rangaiah, Analytical Steps-Different types of Research, 2021).

3.2.2 Quantitative Method

In this method data is collected and analyzed numerically and then used to identify patterns, averages, make predictions, test casual relationships, and generalize results to wider populations (Bhandari, 2020).

It includes the following:

- **Experiment Research** – It is a means of controlling or managing independent variables for calculating the effect it has on dependent variables.
- **Survey** - This requires gathering information from a certain specified number or group of individuals by asking them questions either online, face to face or over the phone.

- **Systematic observation** - This method involves detecting any occurrence and monitoring it in a natural setting.
- **Secondary research:** This research focuses on making use of data which has been previously collected for other purposes such as a national survey (Rangaiah, analyticsteps, 2021).

3.2.3 Qualitative Research Method

This method is concerned with collecting and analyzing non-numerical data (text, video, audio) to understand concepts, opinions, or experiences. It can be used to gather in-depth insights into a problem or generate new ideas for research (Bhandari, 2020).

It includes the following:

- **Observations:** Involves a detailed recording of what a researcher sees, hears of or encounters.
- **Interviews:** Involves one-on-one conversational questions and answers.
- **Focus groups:** Involves asking questions and facilitating discussions among a group of people to generate conclusions from the same.
- **Surveys:** In these surveys, unlike the quantitative research surveys, the questionnaires involve extensive open-ended questions that require elaborate answers.

- **Secondary research:** Requires gathering existing data (images, texts, audio, or video recordings) to conduct text analysis, case study research, or an in-depth interview (Rangaiah, analyticsteps, 2021).

3.2.4 Conceptual Research Method

This research is related to an abstract idea or a theory. It is adopted by thinkers and philosophers with the aim of developing a new concept or to re-examine the existing concepts.

Conceptual Research is mainly defined as a methodology in which the research is conducted by observing and interpreting the already present information on a present topic. It does not include carrying out any practical experiments.

This methodology has often been adopted by famous Philosophers like Aristotle, Copernicus, Einstein, and Newton for developing fresh theories and insights regarding the working of the world and for examining the existing ones from a different perspective.

The concepts were set up by philosophers to observe their environment and to sort, study, and summarize the information available (Rangaiah, analyticsteps, 2021).

Chart 2 Below depicts the Research Methods Used for realizing each specific objective.

Chart No. 2 Research methods (Source: Georges, L.B., Author, February 2023)

Objectives	Research Methods		
	Analytical	Qualitative	Quantitative
1. To create a project charter that authorizes the project and documents the objectives, goals, and business case of the project.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).
2. To create an Integration Management Plan to ensure that all project work processes and activities run efficiently in a coordinated manner for timely completion of project and within budget.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).
3. To create a Scope Management Plan which ensure all project activities are realized within a set structure that enables documenting,	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).

Objectives	Research Methods		
	Analytical	Qualitative	Quantitative
monitoring, and controlling of project resources which are required to achieve project objectives and success.			
4. To create a Schedule / Time Management Plan which seeks to ensure the prioritization of planned project activities and their achievement or realization within stipulated time frames, for greater productivity and efficiency.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).
5. To develop a Cost Management Plan for managing and controlling overall costs aligned to resources and project activities in relation to the cost baseline and ensuring they are	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).

Objectives	Research Methods		
	Analytical	Qualitative	Quantitative
kept within budget limits.			
6. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality that adheres to quality standards and project objectives throughout the project's life cycle.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).
7. To develop a Resource Management Plan to assist in optimizing resource availability and use, by identifying, quantifying, acquiring, and managing the resources required for the project's successful completion.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).

Objectives	Research Methods		
	Analytical	Qualitative	Quantitative
8. To create a Communications Management Plan to serve as a framework that guides, outlines, and details communication needs and expectations to meet project deliverables throughout the duration of the project.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).
9. To develop a Risk Management Plan which would assist in the proactive identification, monitoring, and analysis of internal or external situations that may arise and impact the project positively or negatively through its life cycle.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).

Objectives	Research Methods		
	Analytical	Qualitative	Quantitative
10. To develop a Procurement Management Plan to define the methodological approach for managing the processes of obtaining goods and or services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).
11. To create a Stakeholder Management Plan that ensures the effective involvement, identification, control, and categorization of stakeholders.	As part of this method the use of public opinions through one-on-one interviews and questionnaires to gather data.	The qualitative method Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	Similarly, the quantitative method is achieved by conducting surveys and secondary research (Using data which was previously conducted).
12. To explain, using regenerative and	Primary and secondary information sources,	The qualitative method	Similarly, the quantitative method is

Objectives	Research Methods		
	Analytical	Qualitative	Quantitative
sustainable development, the relationship and impact of the execution of the project and the operation of the final product to establish which effects of the end results favor or disfavor regenerative or sustainable development.	public opinions through one-on-one interviews and questionnaires to conduct an analysis using regenerative and Sustainable development to establish favorable or unfavorable end results to regenerative and Sustainable development.	Is achieved by conducting Interviews, surveys and visual observation of trends in development and culture.	achieved by conducting surveys and secondary research (Using data which was previously conducted).

3.3 Tools

A tool is something tangible, such as a template or software program, used in performing an activity to produce a product or result (PMBOK®Guide, A guide to Project Management Book of Knowledge, 2017).

The tools used in this FGP are listed below and further expounded on:

- Project Charter template
- Work Breakdown Structure (WBS)
- Integration Management Plan template
- Scope Management Plan template

- Schedule Management Plan template
- Scheduling tool
- Activity List template
- Cost Management Plan template
- Project Budgeting template
- Quality Management Plan template
- Quality Management tools
- Human Resource Management Plan template
- Communications Management Plan template
- Communication Matrix
- Risk Management Plan and Risk Register template
- Procurement Management Plan template
- Stakeholder Register template

Chart 3 Below depicts the tools Used for achieving each specific objective.

Chart No. 3 Tools (Source: Georges, L.B., Author, February 2023)

Objectives	Tools
<p>1. To create a Project Charter that authorizes the project and documents the objectives, goals, and business case of the project.</p>	<ul style="list-style-type: none"> • Assumption Log • Milestone Schedule • Key Stakeholder List
<p>2. To create an Integration Management Plan to ensure that all project work processes and activities run efficiently in a coordinated manner for timely completion of project and within budget.</p>	<ul style="list-style-type: none"> • Integration Management Plan Template
<p>3. To create a Scope Management Plan which ensures all project activities are realized within a set structure that enables documenting, monitoring, and controlling of project resources which are required to achieve project objectives and success.</p>	<ul style="list-style-type: none"> • Decomposition • Expert Judgement • WBS • Requirements Matrix
<p>4. To create a Schedule / Time Management Plan which seeks to ensure the prioritization of planned project activities and their achievement or realization within stipulated time frames for greater productivity and efficiency.</p>	<ul style="list-style-type: none"> • Decomposition • Expert Judgement • Activity List • Milestone List • Network Diagrams • Schedule Management Plan Template.
<p>5. To develop a Cost Management Plan for managing and controlling overall costs aligned to resources and project activities in relation to the cost baseline and ensuring they are kept within budget limits.</p>	<ul style="list-style-type: none"> • Cost Estimates <ul style="list-style-type: none"> ○ Analogous Estimating ○ Parametric Estimating ○ Bottom-up Estimating. • Microsoft Project PRO 2021 budgeting template.

Objectives	Tools
	<ul style="list-style-type: none"> • Activity List, Sequencing and Required Resources Table • Project Budget Chart • Data Analysis or Graphs • Cost Management Plan Template
<p>6. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality that adheres to quality standards and project objectives throughout the project's life cycle.</p>	<ul style="list-style-type: none"> • Matrix Diagrams • Quality Reports • Quality Checklists and Sheets • Flow Charts • Quality Management Plan Template
<p>7. To develop a Resource Management Plan to assist in optimizing resource availability and use by identifying, quantifying, acquiring, and managing the resources required for the project's successful completion.</p>	<ul style="list-style-type: none"> • Resource Calendar • Resource Breakdown Structure • Change Request Template • Data Analysis <ul style="list-style-type: none"> ○ Cost benefit Analysis ○ Performance Reviews • Resource Management Plan Template
<p>8. To create a Communication Management Plan to serve as a framework that guides, outlines, and details communication needs and expectations to meet project deliverables throughout the life of the project.</p>	<ul style="list-style-type: none"> • Stakeholder Engagement Matrix • Stakeholder Assessment Matrix • Communication Technology and Methods. • Communication Management Plan Template • Communication Matrix
<p>9. To develop a Risk Management Plan which would assist in the proactive identification, monitoring, and analysis of internal or external situations that may arise and impact the project positively or negatively throughout its life cycle.</p>	<ul style="list-style-type: none"> • Risk Breakdown Structure • Risk Register • Risk Management Plan Template • Probability and Impact Scales • Qualitative Risk Analysis • Quantitative Risk Analysis

Objectives	Tools
<p>10. To develop a Procurement Management Plan to define the methodological approach for managing the processes of obtaining goods and or services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project.</p>	<ul style="list-style-type: none"> • Government of Saint Lucia Procurement Policy or Act. • Advertising and Bidder Conference • Contracts and Agreements • Independent Cost Estimates • Bid documents template. • Procurement Management Plan Template.
<p>11. To create a Stakeholder Management Plan that ensures the effective involvement, identification, control, and categorization of stakeholders.</p>	<ul style="list-style-type: none"> • Stakeholder Management Plan Template • Stakeholder register • Change Request Template • Meetings and Minutes of meetings
<p>12. To explain, using regenerative and sustainable development, the relationship and impact of the project execution and operation of the final product to establish which effects of the end results favor or disfavor regenerative or sustainable development.</p>	<ul style="list-style-type: none"> • Research data analysis • Internet

3.4 Assumptions and Constraints

An assumption is a factor that is considered to be true, real, or certain, without proof or demonstration (PMBOK®Guide, 7th edition, 2021).

It is important to document the project assumptions (including those considered when estimating the project’s scope, schedule, and costs) so that as the project progresses the

Project Manager is able to verify and validate the accuracy of those assumptions and capture lessons learned.

Assumptions also feed into risk management, as each assumption can be tested by asking, “if this assumption was false, would it have an effect on the project?”. If so, the assumption should be documented as a risk (Goodrich, 2018)

A constraint is a limiting factor that affects the execution of a project, program, portfolio, or process (PMBOK®Guide, 7th edition, 2021).

The most common constraints cited in project management are: scope (what the project needs to deliver), schedule (how much time do we have to deliver that scope), and cost (how much funding has been allocated). This is known as the “triple constraint” or “iron triangle” of project management. In addition, the project may be constrained by quality requirements, resources, and risk tolerances. The constraints are related in that if one constraint changes, there will most likely be an impact on the other constraints. The constraints also dictate the perceived quality of the project.

Constraints and assumptions are both important aspects of project management and project planning. Both should be documented and analyzed throughout the project and variances analyzed as part of the project’s lessons learned (Goodrich, 2018)

Chart No 4 Below depicts the assumptions and constraints which may limit the achieving of the specific objective.

Chart No. 4 Assumptions and constraints (Source: Georges, L.B., Author, February 2023)

Objectives	Assumptions	Constraints
1. To create a Project Charter that authorizes the project and documents the objectives, goals, and business case of the project.	That adequate information is readily available to populate and complete the project charter in a timely manner.	The Project Charter is developed and submitted for approval within one week.
2. To create an Integration Management Plan to ensure that all project work processes and activities run efficiently in a coordinated manner for timely completion of project and within budget.	That planned project activities remain unchanged and the information to realize the Integration Management plan is readily accessible.	Availability of resources to complete the Integration Management Plan cannot exceed three (3) working days and availability of financing cannot exceed one (1) month prior to the commencement of works.
3. To create a Scope Management Plan which ensures all project activities are realized within a set structure that enables documenting, monitoring and control of project resources which are required to achieve project objectives and success.	That all information is available to complete the Scope Management Plan and assure that the scope is well defined.	The triple constraint must not be altered during the initiation and planning stage.
4. To create a Schedule / Time Management Plan which seeks to ensure the prioritization of planned project activities and their achievement or realization within stipulated time frames, for greater productivity and efficiency.	That all project activities and deliverables are completed within given time frame to ensure project success.	Inclement Weather Patterns on the Island may interfere with the Project. That the project has to be completed within the given time frame.
5. To develop a Cost Management Plan for managing and controlling overall	That financial disbursements for every project phase are readily	The budget for the Center for Adolescent Renewal and Education

Objectives	Assumptions	Constraints
costs aligned to resources and project activities in relation to the cost baseline and ensuring they are kept within budget limits.	available for timely execution of project activities, processes, and procedures.	project must not exceed the Baseline budget.
6. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality that adheres to quality standards and project objectives throughout the project's life cycle.	<ul style="list-style-type: none"> • That project quality is not affected. • That all regulatory standards and quality control systems are adhered to throughout the project's life cycle. 	<p>Minimal to know information to measure quality for works undertaken by consultants during the design and construction process.</p> <p>Consultants must be present on scheduled days, accompanied by the project manager and requisite personnel to certify specialized works, during and after completion, and must be in accordance with regulatory standards and codes of practice, as per contractual arrangements.</p>
7. To develop a Resource Management Plan to assist in optimizing resource availability and use by identifying, quantifying, acquiring, and managing the resources required for the project's successful completion.	<ul style="list-style-type: none"> • That all resources required for realizing the project meet the required standards and are available locally. • Resource costs must remain within the project's budget. • All project resources be made available throughout the project's life cycle and in accordance with set project schedules. 	<ul style="list-style-type: none"> • All project resources must be made available throughout the project's life cycle and in accordance with set project schedules. • Resource costs must remain within the project's budget. • All resources must be readily available one week before every project activity.
8. To create a Communication Management Plan to serve as a framework that guides, outlines, and	It is assumed that all communication methods and tools will be accepted and approved by	Faulty Communication equipment must be replaced or repaired within two days of non-

Objectives	Assumptions	Constraints
<p>details communication needs and expectations to meet project deliverables throughout the life of the project.</p>	<p>all team members with the expectation to provide timely transfer and receipt of essential information throughout the project's life cycle.</p>	<p>functionality and all-service contracts with relevant service providers must be adhered to.</p> <ul style="list-style-type: none"> • Hardcopies of all reports, minutes, drawings, and instruction must be hand delivered within two (2) working days of emailing copies of the same.
<p>9. To develop a Risk Management Plan which would assist in the proactive identification, monitoring, and analysis of internal or external situations that may arise and impact the project positively or negatively throughout its life cycle.</p>	<p>It is assumed that all project risks have been identified and characterized and key stakeholders have been informed of their potential effect on the project.</p>	<ul style="list-style-type: none"> • Adequate funding must be readily available within the project's budget to cater for the occurrence of identified risk(s), and in the event that financial resources become limited, to undertake risk response. a contingency plan must be in place to acquire funding within two weeks of identification of risk.
<p>10. To develop a Procurement Management Plan to define the methodological approach for managing the processes of obtaining goods and or services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project.</p>	<p>That fairness and transparency will be maintained and application of all procurement rules and regulations will be adhered to in accordance with the Saint Lucia Procurement and Stores Policy or Act.</p>	<p>The procurement strategy is restricted to local bidders and in the event that local competencies do not meet the requirements of the Saint Lucia Public Procurement and Asset Disposal Act- No.19, (2015) bidding must be extended to regional counterparts.</p>

Objectives	Assumptions	Constraints
11. To create a Stakeholder Management Plan that ensures the effective involvement, identification, control, and categorization of stakeholders.	It is assumed that all stakeholders will be managed and kept informed throughout all project phases, for efficient decision making.	Stakeholder's influence, needs and requirements must be altered or changed throughout the phases of project development.
12. To explain, using regenerative and sustainable development, the relationship and impact of the execution of the project and the operation of the final product to establish which effects of the end results favor or disfavor regenerative or sustainable development.	It is assumed that the effects of the final results will be in favor of regenerative and sustainable development.	Information needed to conduct assessment must be readily available to complete this section within one week.

3.5 Deliverables

According to PMBOK®Guide, 7th edition 2021, p. 82) , “A deliverable refers to the interim or final product, service, or result from a project. The deliverables enable the outcomes that the project was undertaken to create. Deliverables reflect the stakeholder requirements, scope, and quality, along with the long-term impact to profit, people, and the planet”.

Deliverables may be tangible or intangible. Change control should be applied once the first version of a deliverable has been completed. The control of the multiple versions or editions of a deliverable (e.g., documents, software and building blocks)

is supported by configuration management tools and procedures (PMBOK®Guide, A guide to Project Management Book of Knowledge, 2017).

Deliverables for this Project are:

- Project Charter
- Integration Management Plan
- Scope Management Plan
- Schedule Management Plan
- Cost Management Plan
- Quality Management Plan
- Resource Management Plan
- Communication Management Plan
- Risk Management Plan
- Procurement Management Plan
- Stakeholder Management Plan
- Explanation and analysis of project execution and whether the end results favor or dis favor sustainable development.

Chart No 5 Below depicts the resultant product achieving from realizing the specific objectives.

Chart No. 5 Below depicts the assumptions and constraints which may limit the achieving the specific objective.

Objectives	Deliverables
<p>1. To create a Project Charter that authorizes the project and documents the objectives, goals, and business case of the project.</p>	<ul style="list-style-type: none"> • Project Charter • Project Purpose • High-level requirements • Overall risks • Summary milestone schedule • Project assumptions and constraints • Key stakeholder list • Financial budget
<p>2. To create an Integration Management Plan to ensure that all project work processes and activities run efficiently in a coordinated manner for timely completion of project and within budget.</p>	<ul style="list-style-type: none"> • Integration Management Plan • Assumption Log template. • Lesson learned Register. • Change request template
<p>3. To create a Scope Management Plan which ensure all project activities are realized within a set structure that enables documenting, monitoring and control of project resources which are required to achieve project objectives and success.</p>	<ul style="list-style-type: none"> • Scope Management Plan • Requirements Traceability Matrix • Scope Statement • Work Breakdown Structure (WBS) • Scope Verification and Validation Template.
<p>4. To create a Schedule / Time Management Plan which seeks to ensure the prioritization</p>	<ul style="list-style-type: none"> • Schedule / Time Management Plan

Objectives	Deliverables
of planned project activities and their achievement or realization within stipulated time frames, for greater productivity and efficiency.	<ul style="list-style-type: none"> • Activity List • Project Schedule (Gantt Chart) • Network Diagram
5. To develop a Cost Management Plan for managing and controlling overall costs aligned to resources and project activities in relation to the cost baseline and ensuring they are kept within budget limits.	<ul style="list-style-type: none"> • Cost Management Plan • Activity Cost Estimate • Budget Chart
6. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality that adheres to quality standards and project objectives throughout the project's life cycle.	<ul style="list-style-type: none"> • Quality Management Plan • Design Development Checklist • Quality Management and Assurance defined steps or procedures.
7. To develop a Resource Management Plan to assist in optimizing resource availability and use, by identifying, quantifying, acquiring, and managing the resources required for project's successful completion.	<ul style="list-style-type: none"> • Resource Management Plan • Resource breakdown structure • Team Charter Template • RACI Chart • Resource calendar • Project Team Assignment Chart.
8. To create a Communication Management Plan to serve as a framework that guides, outlines, and details communication needs and expectations to meet project deliverables throughout the life of the project.	<ul style="list-style-type: none"> • Communication Management Plan • Communication Matrix • Issues Log and Communication Escalation Matrix
9. To develop a Risk Management Plan which would assist in the proactive identification, monitoring, and analysis of	<ul style="list-style-type: none"> • Risk Management Plan • Risk Breakdown Structure

Objectives	Deliverables
<p>internal or external situations that may arise and impact the project positively or negatively through its life cycle.</p>	<ul style="list-style-type: none"> • Probability and Impact Scales and Matrix • Risk Register
<p>10. To develop a Procurement Management Plan to define the methodological approach for managing the processes of obtaining goods and or services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project.</p>	<ul style="list-style-type: none"> • Procurement Management Plan • Procurement strategy and Procedure
<p>11. To create a Stakeholder Management Plan that ensure the effective involvement, identification, control, and categorization of stakeholders.</p>	<ul style="list-style-type: none"> • Stakeholder Management Plan • Stakeholder Analysis Chart • Stakeholder Influence/Interest Model • Stakeholder Register • Stakeholder Engagement Matrix
<p>12. To explain, using regenerative and sustainable development, the relationship and impact of the execution of the project and the operation of the final product to establish which effects of the end results favor or disfavor regenerative or sustainable development.</p>	<ul style="list-style-type: none"> • Explanation and analysis of project execution and whether the end results favor or disfavor using regenerative and sustainable development. • P5 Impact Analysis • P5 Impact Analysis Results

4 RESULTS ANALYSIS

The Results analysis section integrally analyses the results obtained from the application or individual specific objectives to the design and construction of the Center for Adolescent Renewal and Education to produce a Project Management Plan for managing project activities from inception to final completion, with the anticipation of achieving project success.

4.1 PROJECT INTEGRATION MANAGEMENT

4.1.1 Introduction

Additional to the definition provided in 2.2.2.1 above “Project Integration Management, includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the project management process”. A Guide to the Project Management Body of Knowledge, PMBOK® Guide 6th Edition further indicates that in the context of project management, integration management also includes characteristics of consolidation, communication, and interrelationship, that should be applied from the start of the project through to completion.

Realization of project integration management for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.) aids in establishing purpose in the achievement of long-term goals and ensures a general understanding

and identification of processes involved that are coordinated to run efficiently to meet predefined project goals.

4.1.2 Develop Project Charter

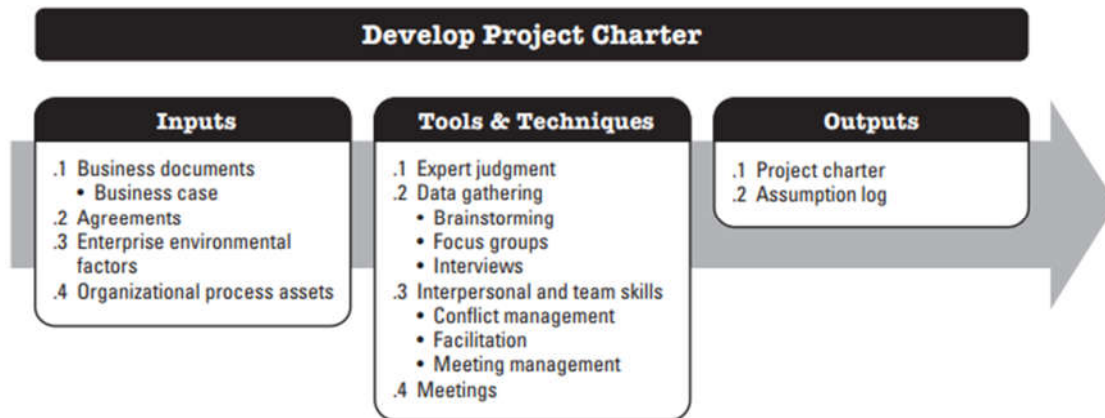
states that “a Project Charter is a document issued by the project initiator or sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities” (PMBOK®Guide, 7th edition, 2021, p. 184).

It is therefore understood that the Project Charter documents high-level project description, requirements, risks, the business needs, current understanding of the customer’s needs, product characteristics, services, or result that it is intended to satisfy, notwithstanding approval requirements. The Project Charter for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.) will be developed using information obtained from several steering committee meetings, project documents and guided by the principles established in PMBOK® 6th Edition, 2017 and PMBOK®, 7th edition 2021, p. 184.

The project charter will be prepared by the project manager assigned to the project and authorized by the Permanent Secretary and relevant stakeholders for commencing project initiation and execution by the project manager.

Figure 18, Below depicts the Inputs, tools and techniques and output from developing the project charter.

Figure 18 : Develop Project Charter, Tools & Techniques, and Outputs



Note. From Project Integration Management, PMBOK®Guide 6th edition, p.75. Copyright 2017 by PMI.

Chart No 6 Below depicts the formal document authorizing the existence of the project.

Chart No. 6 Project Charter (Source: Georges, L.B., Author, April 2023)

4.1.3 PROJECT CHARTER

A. General Information		
Project Name: Design and Construction of the Center for Adolescent Renewal and Education (C.A.R.E.)	Project Number: 2031	
Project Manager: Mr. Lyndon Barry Georges	Ministry / Department: Ministry of Infrastructure, Ports, Transport, Physical Development and Urban Renewal.	
Project Client: <ul style="list-style-type: none"> • Ministry of Education, Sustainable Development, Innovation, Science, Technology and Vocational Training • CARE, Saint Lucia Ltd. 	Division / Section: Department of Physical Development and Urban Renewal. Architectural Section	
DATE: March 4, 2023		
B. Project Sponsor:		
India –UN Development Partnership Fund through UNOSSC		
C. Start Date	End Date	Duration
10 th May 2021	31 st October 2023.	30 Months
D. Application Area (Sector or activity)		
Architecture – Construction / Institutional		
E. Project Objectives		
General Objective		
To design and construct the first phase of an aesthetically pleasing, sustainable, state-of-the-art TVET facility that is functional, secure and in accordance with ILO requirements as well as TVET facility standards inter alia, where marginalized youth and other individuals could access basic and intermediate training in an effort to increase youth training and employment prospects in Saint Lucia.		

Specific Objectives

- To prepare and develop Conceptual and Architectural designs for a Centre for Adolescent Renewal and Education.
- To use long-lasting building materials for the structure of the facility to ensure a life span of a minimum of 60 years.
- To construct a single-story structure aligned and responsive to the project brief.
- To conform with all local building codes and regulations, and occupational safety and health (OSH) guidelines for Saint Lucia not withstanding provisions for present and future pandemics etc.

F. Purpose or Justification

For several years, the administration of CARE has been burdened with the management of its operations at learning centres in various districts on island. Currently, four learning centres have been identified on the island namely in Gros Islet, Odsan, Anse La Raye and Soufriere, all managed by the head office of CARE. This has brought to light some of the challenging issues faced by CARE's administration namely:

- Lack of proper monitoring performances for both teachers and learners.
- Tedious issues with inventory and accounting.
- Difficulty in implementing a proper maintenance schedule for each physical infrastructure.
- Increased fees for the use of utility services.

The administration of CARE is of the opinion that implementation of this project will provide a sense of relief, ownership, and pride, demonstrated, and reflected in its day-to-day operations at the proposed centre. As a new construction project, the goal is to design and construct the first phase of an aesthetically pleasing state-of-the-art TVET facility that is functional, secure, sustainable and in accordance with ILO requirements, local, regional, international and TVET facilities' regulatory standards.

The project selected, "Upgrading Saint Lucia's capacity to provide impactful vocational training for marginalized youth" seeks to address the need to upgrade training facilities, capacity of instructors and to offer coordinated apprenticeship services from national stakeholders' to Saint Lucia's youth.

G. Critical Success Factors

- Procurement of a competent contractor and consultant to conduct project deliverables.
- Adherence to project management best practices and standards during the project's life cycle.
- Short-term job creation during construction.
- Support and buy-in from stakeholders
- Low annual maintenance as a result of introduction of sustainable materials and equipment
- Establishing a model for future projects.

- Timely resolution of project issues.

H. Assumptions and Constraints

Assumptions

- The backfilling of the project site will be necessary due to flooding of the zone during extreme rainy conditions.
- Procurement of goods and services is available locally.
- Project deliverables would be completed in accordance with the triple constraint.
- Delays due to inclement weather and emerging pandemic(s) will arise.
- Adherence to agreed protocols by all stakeholders for change requests and decision making.
- A phase approach to be considered at the implementation stage due to limited funding.
- Seamless integration of construction activities with on-going road rehabilitation projects.
- Timely approval from regulatory authorities.
- Timely availability of resources.

Constraints

- Only one-third of the site is flat land and is accessible from the main road. The remainder of the site is at a much higher elevation, which may not be the best location for the Centre.
- The site is within close proximity to a crude oil storage and transshipment facility.
- Availability of a skilled labour force with daytime working hours from 8am to 4:30pm and nighttime from 6pm onwards which will be subject to all regulatory codes of practice.
- A limited budget not exceeding US\$871,314 (approximately \$2,367,273.00 XCD).
- A 2-year completion date for the project.
- Material and equipment procurement challenges due to shipping and fabrication.
- The availability of building materials in quantity and at the time needed.

I. Risks		
<ul style="list-style-type: none"> • Unexpected flooding due to hurricanes and troughs which might delay construction phases due to closure of site. • Fire due to close proximity to crude oil storage facility can cause immediate closure of site. • Occurrence of mild to low Seismic activity during construction due to Saint Lucia being a volcanic island. • Untimely payments for completion of work phases may result in reduced productivity and untimely deliverables. • Poor communication mechanisms <p>The like occurrence of illnesses and communicable diseases which can affect the performance of workers and inadvertently impact the project negatively.</p>		
J. Budget		
<p>Through the assistance of the India-UN Development Partnership Fund, a total of USD 871,314.81 has been allocated to CARE Limited (registered non-governmental organization (N.G.O.) in Saint Lucia) and the Ministry of Education towards the realization of the design and first phase of construction of the training institute at Cul De Sac, Castries.</p>		
K. Milestone List		
Phase	Milestone	Completion Date
Initiation	Completion of Design Brief.	15 th March 2021
	Finalization of feasibility study.	16 th April 2021
Planning	Completion and approval of conceptual / schematic design proposal.	31 st May 2021
	Completion of all Architectural & Engineering construction drawings.	29 th October 2021
	Commencement of the procurement process for consultants' design and supervision works.	8 th November 2021
	Award of Consultancy contracts	1 st February 2022
	Receipt of Consultant's drawings	14 th April 2022
	Finalization of Bill of Quantities	23 rd May 2022
	Finalization of Implementation Agreement	16 th June 2022
	Receipt of Statutory approvals and building permits.	30 th June 2022

	Commencement of procurement process for works contract	4 th July 2022
	Award of works Contract	16 th September 2022
Executing, Monitoring & controlling	Sod turning	23 rd September 2022
	Commencement of Construction works	3 rd October 2022
	Completion of Installation of all Mechanical, Electrical and Plumbing (MEP) systems and equipment.	17 th Auguste 2023
	Completion of construction works	22 nd September 2023
	Final testing and commissioning	6 th October 2023
Closing	Issuance of performance Certificate	13 th October 2023
	Issuance of Taking over Certificate	20 th October 2023
	Project Closure	31 st October 2023.

L. Project Team

Role	Name	Designation
Project Manager	Lyndon Barry Georges	Chief Architect
Project Manager	Anthony Auguste	Deputy Chief Architect
Member	Florencius Eudovique	Project Architect
Member	Humphrey Regis	Civil Engineer
Member	Sindy King-Hipolyte	Quantity Surveyor (s)
Member	Shane Medard	Architectural Assistant (s)
Member	Nicole St. Croix, Curt Pierre, Nerrie Consantine.	Architectural Technician (s)

M. Relevant Historical Information

The project “Upgrading Saint Lucia’s capacity to provide impactful vocational training for marginalized youth” seeks to address the need to upgrade training facilities, capacity of instructors and to offer coordinated services from national stakeholders’ to Saint Lucia’s youth. At present, CARE offers alternative educational programming with an emphasis on life skills development and technical and vocational education and training (TVET) for marginalized youth (primarily ages 12-19 years) at four (4) satellite locations. The completion of the proposed institute will consolidate these centers and expand CARE’s current services.

N. Stakeholders

- Government of India
- International Labour Organization (ILO)
- Office of the Prime Minister
- Ministry of Finance
- Political directorate
- Administration of CARE.
- Department of Physical Development and Urban Renewal (Architectural Section)
- Ministry of Education, Innovation, Gender Relations, and Sustainable Development.
- Ministry of Infrastructure
- St. Lucia Fire Service
- St. Lucia Solid Waste Management Authority
- Service Providers (Telecommunications, electricity, Water)
- Immediate Business Community
- General Public (Residence within the immediate vicinity)

O. Authorization

Approved project manager:



Lyndon B Georges
Chief Architect
Department of Physical Development & Urban Renewal

Date: March 4th, 2023

Approved by the Project Sponsor:

Hildreth Lewis
Permanent Secretary
Department of Physical Development & Urban Renewal

Date: _____

4.1.4 The Assumption Log

The assumption log is a document for use by the project manager and team to capture, document, track and validate all assumptions throughout the project's lifecycle.

Please see sample assumption log template in Chart No 7 below for use by responsible party or parties.

Chart No. 7 Assumption Log Template

Project Name		Date:				
Project Number		Document Number				
Project Manager		Project Owner/Client				
Assumption Number	Date Identified	Assumption	Validation Assigned To	Validation Due Date	Assumption Valid? Y/N	Status/Comments
01						
02						
03						
04						
05						

Note. Assumption Log Template for recording assumptions. From MyPM ,2023, (<https://www.mypmlc.com/project-management-resources/free-project-management-templates/assumption-log-template/>). Copyright 2011-2023, In the public domain, free download.

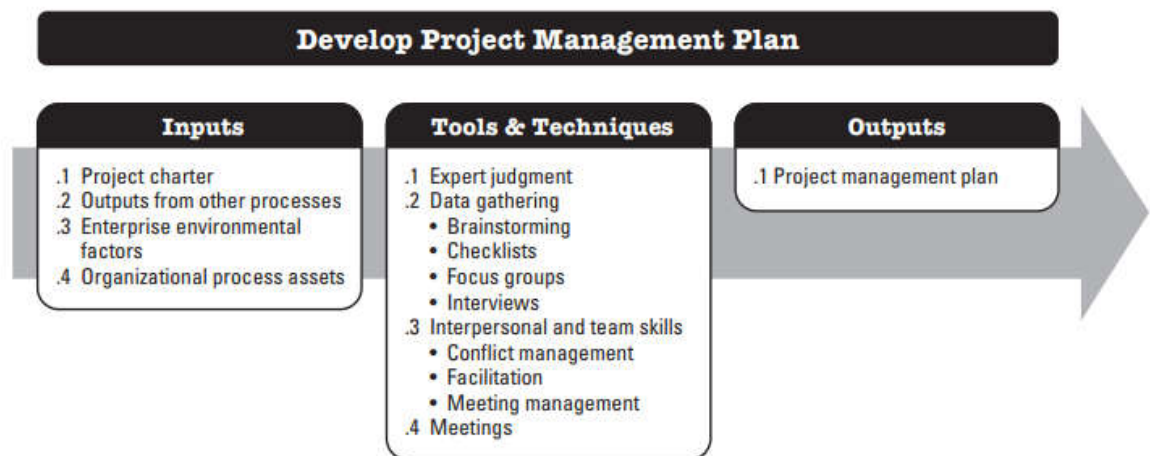
4.1.5 Develop Project Management Plan

The development of the project management plan involves defining, preparing, and coordinating all plan components and consolidating them into an

integrated project management process (PMBOK®Guide, A guide to Project Management Book of Knowledge, 2017).

Figure 19, Below depicts the Inputs, tools and techniques and output from developing the Project Management Plan.

Figure 19 : Develop Project Management Plan



Note. From Project Integration Management, PMBOK®Guide 6th edition, p.82. Copyright 2017 by PMI.

4.1.6 Direct and Manage Project Work

Direct and manage project work is the process of leading and performing the work defined in the project management plan, while additionally, resolving any issues that may arise during the implementation of approved changes, to achieve the project's objective.

4.1.7 Manage Project Knowledge

Manage project knowledge is the strategic management of information, experiences and practices acquired in past and current project realization by using lessons learnt and knowledge captured in the past to improve on the current project, while the knowledge generated during the design and construction of the center for adolescent renewal and education (C.A.R.E.) is made available to future projects.

Information is systematically collected and analyzed to derive meaningful conclusions, and using technology and processes to improve knowledge sharing, employees or project team members are taught to use the skills, experiences, and expertise before, during and after the project to achieve the projects objectives and contribute to organizational learning.

The Lessons Learned Register template will be used to record knowledge gained during project phases, stages, or iterations for improved future performance for the team and the organization as indicated in PMBOK®Guide, 7th edition (2021).

Please see sample Lessons Learned Register template in Chart 8 below for use by responsible party/parties.

4.1.8 Lessons Learned Register Template

Chart No. 8 Lessons Learned Register Template

Project Name		Date:	
Project Number		Document Number	
Project Manager		Project Owner/Client	

Log Number	Date Identified	Describe contributing factor(s) or cause(s).	Describe the impact to the project.	Scope, time, cost, quality, human resources, communications, risk, or procurements?	What change or improvement could prevent the same problem from occurring again or ensure that the success reoccurs?
01					
02					
03					
04					
05					
06					
07					

Note. Assumption Log Template for recording assumptions. From MyPM ,2023, (<https://www.mypmlc.com/project-management-resources/free-project-management-templates/lessons-learned-log-template/>). Copyright 2011-2023, In the public domain, free download.

4.1.9 Monitor and Control Project Work

Execution of the design and construction of the center for adolescent renewal and education (C.A.R.E.) will be monitored and controlled for overall improvement of project objectives and stakeholder understanding and comprehension of project status throughout the project's lifecycle. The project manager will establish systems and tools to collect appropriate data for recording and distributing information via preparation of status reports communicated and aligned to the project management plan.

4.1.10 Perform Integrated Change Control

Project change control guarantees effective management of changes to deliverables, project documents, inter alia the project management plan and creates an authorizing mechanism for approval or rejection of alterations to products, services, or processes leading to final communication of decision taken. All stages, processes and activities complementing the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.) project incorporates the change management process as a defense mechanism avoiding unnecessary alterations or adjustments by ensuring the documenting, evaluating, and communicating formally the agreements on change implementation is done as required throughout the project's lifecycle.

Please see Change Request Template in Chart 9 below to be used for authorizing changes to the project, by responsible party/parties.

4.1.11 Change Request Template

Chart No. 9 Change Request Template

Project Name	Design and Construction of the Center for Adolescent Renewal and Education	Date:				
Project Number	2031	Document Number	SS-ASEC-001			
Project Manager	Lyndon B Georges	Project Owner/Client	Ministry of Education C.A.R.E – Center for Adolescent Renewal and Education			
CHANGE REQUEST						
					Change Request Number	01
Requesters Name		Date of Request				
Requesters Contact		Priority	High	Medium	Low	
Item to be changed						
Change Description						
Predicted Timeline			Estimated Cost			
Change Evaluation						
Evaluator's Name		Date or Evaluation				
Expected Outcome						
Work Required						

Area of Impact	Impact Description	Impact Level		
		High	Medium	Low
Scope				
Schedule				
Cost				
Quality				
Change Review / Approval				
Reviewers' Name		Status	Accepted	Rejected
Reviewers' Signature		Date of Review		
Additional Comments				
Change Tracking				
Tracking Agent		Last Updated		
Tracking Agent Signature		Version Number	0.00	

Note. Change Request Template for recording and controlling change throughout the project lifecycle. From Smartsheet Inc, 2023, (<https://www.smartsheet.com/free-change-management-templates>). Copyright 2023, In the public domain, free download.


4.1.12 Close Project or Phase

A post project meeting will be scheduled by the project manager for a thorough review of the initial project scope versus the final project scope of works. This is concurrent with scope revisions conducted upon finalizing every project phase. The post project review will be conducted on the project site upon full completion of construction and is an interactive session that takes into consideration analysis of all final processes completed to facilitate the handing over of the building

to the owner(s). This includes completing all items on the pinch list, conducting a final walkthrough and formalizing training components where necessary.

4.1.13 Integration Management Plan Approval

The signatures of the people below indicate an understanding of the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.2 PROJECT SCOPE MANAGEMENT

Scope Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

According to PMBOK®Guide(2017), The Project Scope Management processes are defined as:

- Plan Scope Management
- Collect Requirements
- Define Scope
- Create WBS
- Validate Scope
- Control Scope

4.2.1 The Scope management Plan

This plan is an integral component of the project or program management plan that describes how the scope will be defined, developed, monitored, controlled, and validated (PMBOK®Guide, 7th edition, 2021). It is developed in the planning phase of the project and serves as a guideline that directs scope management, keeping the project within limits, for achieving objectives and success.

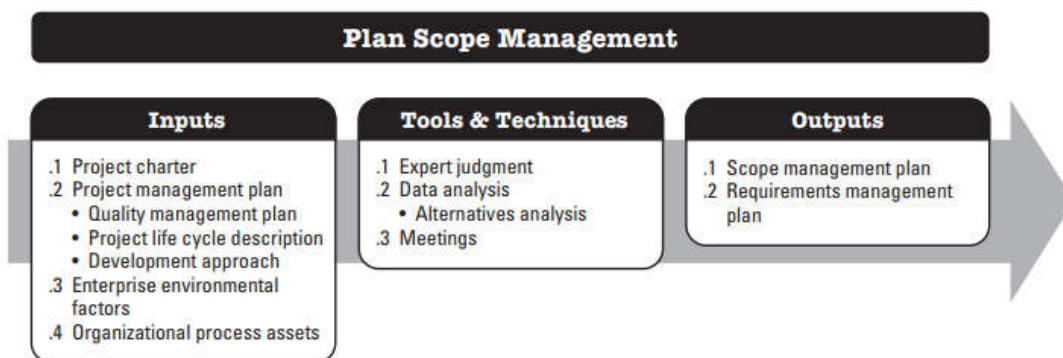
PMBOK® Guide, 6th Edition 2017 emphasises, that the development of the scope management plan and the detailing of the project scope, begins with the analysis of information contained in the project charter, the latest approved subsidiary plans of the project management plan, historical information contained in

the organizational process assets, and any other relevant enterprise environmental factors.

4.2.2 Plan Scope Management

Figure 20, Below depicts the Inputs, tools and techniques and output from the Plan Scope Management process.

Figure 20 Plan Scope Management :Inputs, Tools & Techniques, and Outputs



Note. from Project Integration Management, PMBOK®Guide 6th edition, p.82. Copyright 2017 by PMI.

The Plan Scope Management Process for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.) will be done based on guidelines provided by PMBOK®Guide 6th edition (2017) and establishes a formal structure to document how the project scope will be defined, validated, and controlled. Seldom, occurrences of scope change would present themselves during

the design phase, for the explicit reason that throughout this process scope is limited to the design brief and regulations governing design classifications (Residential, Recreational, Commercial, Institutional, Agricultural). During the construction phases, the likelihood of scope changes as a result of risks, constraints, and unforeseen circumstances which are highly possible especially during excavation and foundation works. Hence allocations are made within this scope management plan to perform this process at predefined points in the project. The input for the process is the Project Charter, approved subsidiary plans of the project Management Plan, enterprise environmental factors, and organizational process assets.

The project manager will be responsible for the overall oversight and coordination of scope management and approval of the Scope Management Plan and Processes. The plan will also include roles and responsibilities, scope change control definition and verification methods and the work breakdown structure and accompanying dictionary. Expert judgement, data analysis and meetings with key stakeholders will be used as tools and techniques in the development of the Scope Management Plan for the project.

4.2.3 Collect Requirements

The collect requirements process for this project will entail determining, documenting, and managing stakeholder requirements to meet established project objectives. To facilitate the process, key stakeholders will be engaged to gather feedback and provide guidance on pertinent requirements specific to the design and

construction of this vocational school, and its foreseeable impact on the urban landscape. Requirements for this project will be predefined by its owners (Ministry of Education and C.A.R.E) nevertheless, the key stakeholder's feedback will be paramount and assist in clarifying expectations, improving deliveries, and the overall end result. Data gathering techniques (interviews, meetings, brainstorming, expert judgement, repertoire analysis and internet research) will be employed to validate and adjust where necessary predefined project scope. Minutes of stakeholder meetings will assist in identifying key issues discussed, activities to be undertaken and essential requirements for prioritization, through each phase of the project.

Chart No 10 below (Requirements Traceability Matrix), outlines some of the requirements developed for the design and construction of the Center for Adolescent Renewal and Education.

4.2.3.1 Requirements Traceability Matrix

According to PMBOK®Guide, 7th edition (2021), a Requirements Traceability Matrix is a grid that links product requirements from their origin to the deliverables that satisfy them.

Chart No. 10 Requirements Traceability Matrix

Requirements Traceability Matrix			
Project Name	Design and Construction of the Center for Adolescent Renewal and Education	Date:	
Project Number	2031	Document Number	RTM-ASEC-001
Project Manager	Lyndon B Georges	Project Owner/Client	Ministry of Education C.A.R.E – Center for Adolescent Renewal and Education

Req. ID	Requirement Description	Goals/Objectives	Project Phase	Priority	Requested by
	General				
001	Accommodation should be made for differently abled individuals notwithstanding the inclusion of designated safe pedestrian zones, shallow gradient ramps and a canopy or covered access for customers and clientele transiting to and from public transportation.	To ensure that pedestrian accesses are constructed to required standards and that the safety of all categories of users is prioritized.	Design	High	Ministry of Education and CARE
002	Access must be provided for emergency, refuse collection and services and delivery vehicles.	To ensure that vehicular access is designed to required standards for varying classifications of vehicles.	Design	High	Ministry of Education and CARE
003	Adequate parking spaces, reflective of the requirements of the Saint Lucia Physical Planning and Development Act, should be made available for staff and visitors, and to be able to accommodate large functions such as graduations and conferences.	To ensure that the requirements of the Saint Lucia Physical Planning and Development Act is adhered to for the said.	Design	High	Ministry of Education and CARE
004	The building concept and external landscape must consider the character of the building zone and site topography, its shape, contours, subsoil, local vegetation, ecology, and micro-climate.	To ensure that conceptual studies and solutions are aligned to sustainability and preservation of local characters and species.	Design	High	Ministry of Education and CARE
005	The space planning should be responsive to covid-19 and other pandemic or similar future occurrences.	To ensure that the functionality of building spaces is designed to meet requirements for present and future pandemics etc. according to required standards.	Design	High	Ministry of Education and CARE

Req. ID	Requirement Description	Goals/Objectives	Project Phase	Priority	Requested by
	Accommodation Requirements				
006	<p>The Catering and Hospitality Classroom and Food Preparation work area requires the separation of a hot and cold kitchen area from the pastry kitchen area and a pantry. Seamless, solid surfaces that are durable and hygienic are recommended for the countertop. As much as possible, it is recommended that the use of wood is reduced in the working area and good quality stainless steel is utilized. Floor space of the lab should be 108 sq. ft per trainee and a maximum class size of 20. Lab layout should allow for proper workflow. Storage of cooking gas should be in two (2) large containers, between 800 and 2000 liters, outside of the building in a fenced location. Classroom/ breakout rooms should be separate from the actual kitchen workshop and instructor's space adjacent with view of Lab.</p> <p>(Reference the NCTVET Food Preparation & Food Service & Beverage Service Facilities Standards for specific details)</p>	To ensure that the building is designed and constructed to the required NCTVET Food Preparation & Food Service & Beverage Service Facilities Standards.	Design	High	Ministry of Education and CARE
007	<p>The layout for the Electrical Installation Workshop/Classroom must include workstations that accommodate a maximum of four (4) trainees with a class size of 20 trainees. Workstations should be fitted with electrical points. Open floor space is also needed to accommodate the setting up of electrical layouts. The recommended floor space is 100 sq. ft per trainee. Instructor's office adjacent with view of workshop.</p> <p>(Reference the NCTVET Electrical Installation Facilities Standards for specific details)</p>	To ensure that the building is designed and constructed to the required NCTVET Electrical Installation Facilities Standards	Design	High	Ministry of Education and CARE
008	Toilet facilities should be designed to a standard that ensures privacy and discourages vandalism. Provision should be made for male and female Patrons, the disabled and allowance must also be made for showers and change rooms.		Design	High	Ministry of Education and CARE
009	The training area in the Auto Mechanics Workshop/ Classroom is to be divided into stalls which will house the main components for training in the key areas of the automotive trade including suspension and steering, wheel alignment and wheel balancing, manual and automatic suspension, tune-up, and engine repairs. The maximum number of trainees to be accommodated in the class is twenty (20) with a team size of a maximum of five (5). The recommended floor space is 215 sq. ft per trainee. Provision must also be	To ensure that the building is designed and constructed to the required NCTVET Automotive Repairs and Maintenance Facilities Standards	Design	Medium	Ministry of Education and CARE

Req. ID	Requirement Description	Goals/Objectives	Project Phase	Priority	Requested by
	made for a hoist. Instructor's office with view of workshop should be included. (Reference the NCTVET Automotive Repairs and Maintenance Facilities Standards for specific details).				
010	Workshop layout for the Carpentry/Joinery Classroom/Workshop must include workstations that accommodate a maximum of four (4) trainees with a class size of 10 - 20 trainees. The recommended floor space is 100 sq. ft per trainee. Instructor's office with view of workshop is need included. Also, a well-ventilated spray room is needed. (Reference the NCTVET Carpentry & Joinery Facilities Standards as well as the Furniture or Cabinet Making Facilities Standards for specific details).	To ensure that the building is designed and constructed to the required NCTVET Carpentry & Joinery Facilities Standards as well as the Furniture or Cabinet Making Facilities Standards	Design	medium	Ministry of Education and CARE
011	Workshop layout for the Air Conditioning and Refrigeration Workshop/ Classroom must include workstations that accommodate a maximum of four (4) trainees with a class size of 20 trainees. The recommended floor space is 100 sq. ft per trainee. Instructor's office adjacent with view of workshop. (Reference the NCTVET Air Conditioning & Refrigeration Maintenance Facilities Standards for specific details)	To ensure that the building is designed and constructed to the required NCTVET Air Conditioning & Refrigeration Maintenance Facilities Standards	Design	medium	Ministry of Education and CARE
	The layout for the Sewn Products Workshop/Classroom must include workstations for sewing, that accommodate a maximum of four (4) trainees with a class size of 20 trainees. Cutting tables with free space for setting up ironing boards in between workstations and storage area are also needed as well as a designated washing up area. The recommended floor space is 100 sq. ft. per trainee. Instructor's office with view of workshop included. (Reference the NCTVET Garment Construction & Manufacturing Facilities Standards for specific details)	To ensure that the building is designed and constructed to the required NCTVET Garment Construction & Manufacturing Facilities Standards	Design	medium	Ministry of Education and CARE
012	The layout for the Construction Trades Workshop/ Classroom must include workstations that accommodate a maximum of four (4) trainees with a class size of 20 trainees. The recommended floor space is 100 sq. ft per trainee. Adequate space between workstations would need to be allocated for when long pieces of material are being used. Instructor's office adjacent with view of workshop.	To ensure that the building is designed and constructed to the required NCTVET Plumbing Facilities Standards and Tiling-Masonry Facilities Standards	Design	medium	Ministry of Education and CARE

Req. ID	Requirement Description	Goals/Objectives	Project Phase	Priority	Requested by
	(Reference the NCTVET Plumbing Facilities Standards and Tiling-Masonry Facilities Standards for specific details).				
013	The production of a training manual/ facilities maintenance plan should be considered as part of the design and construction that can guide operations and maintenance personnel in the overseeing of the facilities.	To ensure that a planned and structured maintenance regime is established for the operational phase of the project.	Training and operational phases	medium	Ministry of Education and CARE
014	The mechanical, electrical, and plumbing distribution strategy adopted should be well planned, rational, and easily maintainable.	To ensure that a planned and structured maintenance regime is established for the operational phase of the project.	Operational Phase	medium	Ministry of Education and CARE
015	The facilities should be designed and constructed in a manner that reduces running and maintenance costs and ensures the health and safety of all users.	To ensure that the project is designed and constructed in accordance to required standards and is sustainable.	Design Training and Operational phases	High	Ministry of Education and CARE

4.2.4 Define Scope

Having realized the collect requirements process for the project it will be essential to define the outcomes, benefits and deliverables of the project and requirements to achieve them. This will assist in providing clear boundaries and goals and objectives for an enabling environment to keep the project on-track. This will result in the development of the scope statement for the project.

According to PMBOK®Guide, 7th edition (2021), “a project scope statement is a description of the project scope, major deliverables and exclusions. It also includes information on assumptions and constraints and project budget.”-insert page number for direct quote.

It allows for more detailed planning, guides the team’s work during execution of the project and assures that the project remains within the defined scope baseline. Requirements for change requests or additional work are contained within or outside the project’s boundaries.

4.2.4.1 Scope Statement

Introduction

The scope statement for the design and construction of the Center for Adolescent Renewal and Education will set out to document the project’s scope by identifying major project deliverables for each phase of the project and defining

work parameters, project benefits, assumptions, constraints, and acceptance criteria for the deliverables. This scope statement is a formal confirmation of results to be delivered by the project and will ensure that the project remains within defined scope baseline requirements. It will provide direction for project activities and communicate project scope to stakeholders and the project team.

Chart No. 11 below, depicts the scope statement for the design and construction of the Center for Adolescent Renewal and Education and for use by responsible party/parties.

Chart No. 11 Scope Statement

Scope Statement

Project Name	Design and Construction of the Center for Adolescent Renewal and Education	Date:	
Project Number	2031	Document Number	SS-ASEC-001
Project Manager	Lyndon B Georges	Project Owner/Client	Ministry of Education C.A.R.E – Center for Adolescent Renewal and Education

Project Objectives

To design and construct the first phase of an aesthetically pleasing, sustainable, state-of-the-art TVET facility that is functional, secure and in accordance with ILO requirements as well as TVET facility standards inter alia, where marginalized youth and other individuals could access basic and intermediate training in an effort to increase youth training and employment prospects in Saint Lucia.

Project Benefits

Centrally located facility accessible to all.

Reduced operational and maintenance cost.

Employment opportunities available during construction and maintenance of the finalized project.

Improved monitoring performances for both teachers and learners

Improved management of resources due to central location with accessibility for all.

Establishment of a state-of-the-art facility that is functional, secure, sustainable and in accordance with ILO requirements, local, regional, international, and TVET facilities regulatory standards.

Project Deliverables - Design Phase
Development of Project Brief
Realization of Feasibility Study and preparation of Feasibility Report by Architectural Section of the Department of Physical Development and Urban Renewal.
Development of conceptual design for project.
Presentation of design concept
Preparation of Schematic Drawings and presentation
Preparation and finalization of construction set of drawings
Hiring of consultants (MEP engineers-Mechanical, Electrical, Plumbing; HVAC engineer-Heating, Ventilation and air conditioning, Structural engineer)
Preparation and submission of requisite drawings by consultants.
Submission of completed drawing sent to statutory agencies and application for building permits
Closure of Design Phase

Project Deliverables-Procurement (Tendering) Phase
Shortlisting of construction companies
Prequalification of shortlisted companies
Finalization tender packages (bidding documents)
Submission of Tender packages to qualifying companies
Receipt of Submitted Tenders
Evaluation of Tenders and selection of winning bid
Approval of winning bidder and contracting.
Closure of Procurement (Tendering) Phase

Project Deliverables-Construction Phase
Construction of connecting road from Cul Du Sac – Soufriere highway to the construction site
Site preparation and Setting-out of buildings
Excavations, construction of foundations and backfilling
Construction of toilet block
Construction of Catering and Hospitality Block
Construction of Administrative and classroom block
Construction of walkways and setting-out of landscape
Construction of security hut
Finishes to toilet block
Finishes to Catering and Hospitality Block
Finishes to Administrative and classroom block
Finishes to walkways and landscaping
Finishes to Security hut
Electrical Wiring and equipment installations
Structured telecommunication and security cabling and equipment Installations
Testing and commissioning
Preparation of final reports
Dry run
Satisfactory completion certificate
Handing over
Closure of construction Phase

Project Deliverables-Defects Liability Phase
Undertake checks on the last workday of every month and provide a checklist of defects where necessary.
Prepare final project report
Issue performance certificate.
Prepare final account for completed works at the end of the defect's liability period as per contractual agreement.
Complete As-built Drawings
Project Closure.

Project Exclusions
Works shall not include modifications or reparations to adjoining highway drain along the Cul Du Sac Soufriere Highway delimiting the project site.
Construction Works shall not be realized beyond the eastern concrete drain on site.

Success / Acceptance Criteria
The Project must meet the Performance criterion set out in the client's brief with respect to design and construction standards, sustainability, inclusiveness, flexibility and adaptability, quality, function, comfort, economics, durability, and consensus building, all within schedule time and budget.

Estimated Cost of Project		
Phase	Description	Estimated Cost
Full Project	Comprising of Catering and Hospitality Block, Administrative Block, Auto Mechanics Block, Carpentry and Joinery Block, Air Conditioning and Refrigeration Block, Electrical Installation Block, Sewn Products Block, Construction Trades Block, Security Hut, Parking, Walkways, and Landscaping.	US\$ 1,611,736.90 (approximately \$4,367,273.00 XCD)
Phase No. 01	Comprising of Catering and Hospitality Block, Administrative and classroom Block, Security Hut, Parking, Walkways, Driveways, and Landscaping.	US\$871,314 (approximately \$2,367,807.00 XCD)

Project Constraints
The Design and Construction of the Center for Adolescent Renewal and Education must not exceed US\$871,314 (approximately \$2,367,273.00 XCD) and must be completed within the allotted 30-month period.

Project Assumptions
It is assumed that climatic conditions will be favorable to allow for uninterrupted construction activities which would possibly affect scope and cost.
It is assumed that there will be timely availability and disbursement of funds for continuity of construction works
It is assumed that project completion will be within budget and allotted time frame.
It is assumed that project team members for the design and construction phase meet the benchmark skill requirements for their respective disciplines and that their employment during the said phases is not compromised by accidents, incidents, and illness.
It is assumed the team member replacement during project phases be prompt for efficiency and continuity of work.

Decision	
<input checked="" type="checkbox"/> Approved	<input type="checkbox"/> Rejected
<input type="checkbox"/> Approved with modifications	<input type="checkbox"/> Deferred
Additional Comments	
Project Scope statement is approved.	

This scope statement must be reviewed by key stakeholders (ILO, C.A.R.E, Department of Education) and subsequently Signed by The Approved Sponsors.

Approved project manager:



Lyndon B Georges
 Chief Architect
 Department of Physical Development & Urban Renewal

Date: March 4th, 2023

Approved by the Project Sponsors:

 Karleen Mason (Dr.)
 Executive Director
 C.A.R.E Ltd.

Date: March 4th, 2023

 Claudia Louis (Dr.)
 Chief Planning Officer
 Department of Education, Innovation and Gender Relations

Date : March 4th, 2023

4.2.5 Roles and Responsibilities

The various roles in managing the scope of the project will be handled by the project manager, chief architect, project team, project engineer, sponsor, and the Change Control Board (CCB). Subsequent to defining the project boundaries via the development and approval of the scope statement, roles and responsibilities for the design and construction of the Center for Adolescent Renewal and Education will be clearly defined and understood, for each team and individual team members in order to ensure that work performed on the project is within the established scope throughout the entire duration of the Project.

Chart No. 12 below identifies key personnel mentioned above and their corresponding roles and responsibilities.

Chart No. 12 Roles and Responsibilities Matrix (Source: Georges, L.B., Author, May 2023)

Name	Role	Responsibility
	Project Sponsor	<ul style="list-style-type: none"> • Approves Scope Management Plan. • Provides high-level scope definition (Project Charter). • Reviews escalated scope issues and provides direction for resolution. • Approves major scope change requests. • Overall decision-making responsibility for Scope Management activities.

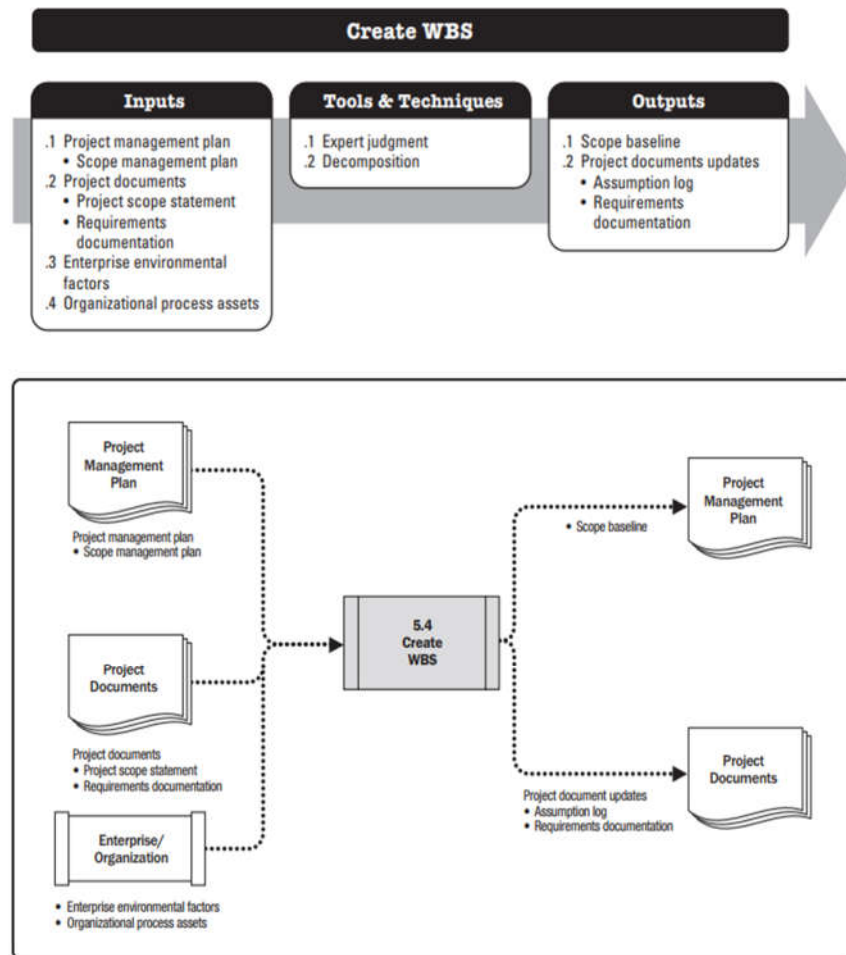
Name	Role	Responsibility
Lyndon B Georges	Chief Architect	<ul style="list-style-type: none"> • Establishes project team for the design and construction of the project. • Directs, conceptualizes, and manages the design process by engaging stakeholders and coordinating the work of the project team to ensure that the project remains within approved scope, budget, and applicable laws. • Guides the project implementation process through preparation of plans, briefs and work programmes for monitoring and evaluation of the construction phase. • Submits change request to the change control board and communicates change request to project sponsor. • Rejects or approves change request.
<p>1. Lyndon B Georges</p> <p>2. Anthony Auguste</p>	Project Managers	<ul style="list-style-type: none"> • Have overall responsibility for scope management. • Oversee the development of the Scope Management Plan. • Oversee the scope of change management process. • Approve scope change requests within his/her authority. • Escalate scope and change issues. • Ensure that scope changes are incorporated into appropriate project documents
<p>Project Team- Architectural Design and Construction Management team Lead by the Project Architect</p> <p>SMEs- Mechanical, Electrical, Plumbing</p>	Project Team members and Subject Matter Experts (SMEs)	<ul style="list-style-type: none"> • Engage in design development, preparation of construction drawings, technical specifications, cost estimates and development of bills of quantities. • Help develop the project scope statement. • Submit scope change requests. • Review scope change requests when assigned. • Participate in team-level scope change reviews • Provide feedback as and when required.

Name	Role	Responsibility
(MEP); Heating, Ventilation, Air conditioning (HVAC) consultants etc.		
	Project Stakeholders	<ul style="list-style-type: none"> • Provide project requirements document. • Receive project deliverables. • Communicate formally request for scope change and justification for the same.
	Change Control Board	<ul style="list-style-type: none"> • Reviews change request submitted by key stakeholders. • Evaluates risks and benefits associated with change request. • Ensures change is made in an organized and controlled manner. • Manages change activity from initial request through technical recommendation, to approval for implementation. • Identifies technically sound improvements having high benefit-to-cost ratios and thereby enhancing overall business performance. • Interfaces with those impacted to coordinate implementation of the change in a coordinated effort.

4.2.6 Create Work Breakdown Structure

Figure 21, Below depicts the Inputs, tools and techniques, output, and flow diagram to create hierarchical decomposition of the work packages for the project.

Figure 21 Create WBS: Inputs, Tools & Techniques, and Outputs and Data Flow Diagram



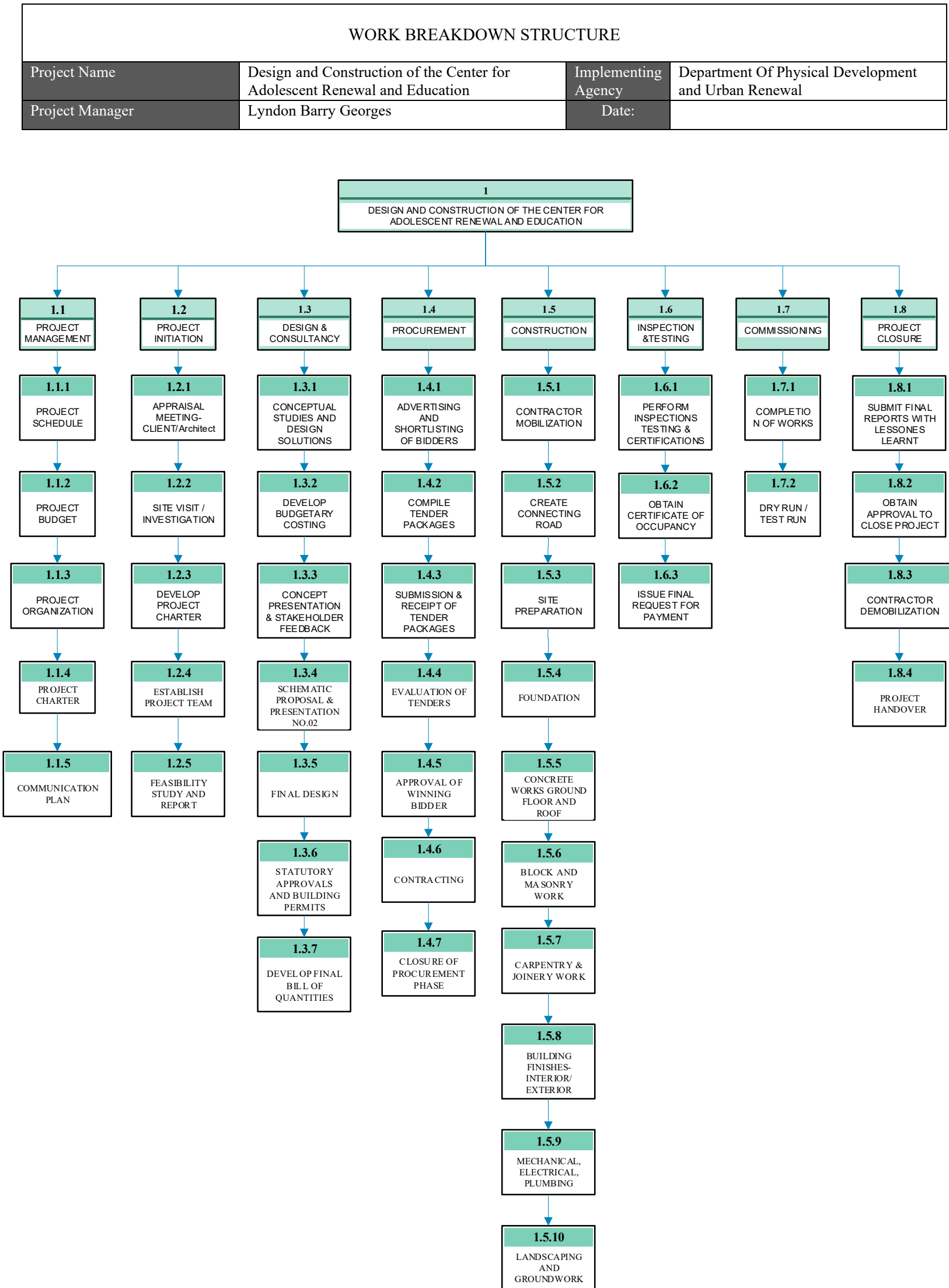
Note. from Project Scope Management, PMBOK®Guide 6th edition, p.156. Copyright 2017 by PMI.

4.2.6.1 The Work Breakdown Structure

The work breakdown structure (WBS) is an essential deliverable-oriented, project management tool used as part of this project to create a hierarchical decomposition of the work packages to be executed by the project team for accomplishing the project objectives. Its application in the design and construction of the Center for Adolescent Renewal and Education assists in defining a structured roadmap for the project while improving the manageability of its activities or products and simultaneously allowing for measuring project completion, identifying milestones, and allocating budget resources within clearly defined project limits.

Chart No. 13, Below depicts the Work Breakdown Structure for improving the manageability of project activities for the project.

Chart No. 13 Work Breakdown Structure (Source: Georges, L.B., Author, May 2023)



4.2.6.2 Work Breakdown Structure Dictionary

Chart No. 14, Below depicts the Work Breakdown Structure dictionary for providing detailed information about deliverables.

Chart No. 14 Work Breakdown Structure Dictionary (Source: Georges, L.B., Author, May 2023)

WBS DICTIONARY			
Project Number	2031	Project Name	Project Manager
		Design and Construction of the Center for Adolescent Renewal and Education	Lyndon B Georges
Level	WBS code	Work Package	Description of works
1	1	Design and Construction of the Center for Adolescent Renewal and Education	Planning, conceptualizing, and developing architectural, engineering, and urban designs for the project inter alia, the provision of project management services to support the construction of the buildings and infrastructure is accordance to standards and best practices to ensure an environmentally, socially, and economically sustainable project.
2	1.1	Project Management	To establish all work programmes useful to guiding project implementation processes through-out the project's life.
2	1.2	Project Initiation	Realization of fundamental activities to gain information to guide the conceptual design.
2	1.3	Design and Consultancy	Conceptualization and preparation of schematic and construction drawings necessary for realization of consultancy services.
2	1.4	Procurement	Conduct procurement activities construction and consultancy services as directed by the Saint Lucia Public Procurement and Asset Disposal Act.
2	1.5	Construction	Realizing of all works, equipment, and services necessary to complete project in accordance with contractual agreement.

WBS DICTIONARY			
Project Number	2031	Project Name	Project Manager
		Design and Construction of the Center for Adolescent Renewal and Education	Lyndon B Georges
Level	WBS code	Work Package	Description of works
2	1.6	Inspection and Testing	Conducting inspection of all construction and consultancy works by regulatory agencies for adherence to quality standards and undertaking of testing for regulatory compliance and performance standards.
2	1.7	Commissioning	Conducting final assessments and test runs of equipment and services for compliance to whole-building design process.
2	1.8	Project Closure	Outlining all activities necessary to finally close the project.
3	1.1.1	Project Schedule	Generating a timetable of all project activities and processes to ensure alignment to Project Scope Management.
3	1.2.1	Appraisal Meeting- Client Architect	Meeting to receive clients' instructions and requirements, discuss design parameters, obtain site information, and familiarize client with conditions of engagement.
3	1.3.1	Conceptual studies and Design Solutions	Prepare design proposals to illustrate scale and character of project.
3	1.4.1	Advertising	Realizing public invitation for bidding via the use of digital media, newspapers and or government gazette.
3	1.5.1	Contractor Mobilization	Allowing a contractor, a stipulated timeframe as per contractual agreement for mobilizing plant, equipment etc. before construction commences.
3	1.6.1	Perform Inspections	Conducting quality control inspection for construction and service activities.
3	1.7.1	Completion of works	Marking the end of all construction and consultancy works for the project.
3	1.8.1	Conduct Post Project Review	Realizing final walkthrough and detailed revision of tests and inspection reports.
4	1.1.2	Project Budget	Establishing final project budget as per design and available funding.
4	1.2.2	Site Visit / Investigation	Conducting physical site familiarization visit to investigate and gather vital information that will positively or negatively impact the building during its life cycle.
4	1.3.2	Develop Budgetary Costing	Developing costing associated to conceptual, schematic, and final design for the project.
4	1.4.2	Shortlisting of bidders	Evaluating bidders through the application of prequalification criteria in accordance Saint

WBS DICTIONARY			
Project Number	2031	Project Name	Project Manager
		Design and Construction of the Center for Adolescent Renewal and Education	Lyndon B Georges
Level	WBS code	Work Package	Description of works
			Lucia Public Procurement and Asset Disposal Act.
4	1.5.2	Create connecting Road	Constructing a road network connecting the site to the Main Highway.
4	1.6.2	Testing and Certification	Testing of all MEP, HVAC, and telecommunication infrastructural works for regulatory compliance and performance standards.
4	1.7.2	Dry Run / Test Run	Operationalizing building systems, services, and equipment for functionality purposes and fault detection if any.
4	1.8.2	Submit final report with Lessons Learnt	Submitting report
5	1.1.3	Project Organization	Arranging all project processes and activities in order of execution from inception to completions.
5	1.2.3	Develop Project Charter	Developing a document that defines the objectives, scope, and stakeholders of the project.
5	1.3.3	Presentation No.1 and Stakeholder feedback	Presenting of philosophical and volumetric interpretation of the building and how it integrates with the urban landscape.
5	1.4.3	Pre-Qualification Process	Assessing each bidder using a set check list of criteria to qualify for tendering on the construction of the project.
5	1.5.3	Preliminaries	Establishing all preconstruction activities, systems and mechanisms before the building process commences.
5	1.6.3	Inspection and Testing Reports	Preparing Inspection and test reports for all installations.
5	1.7.3	Submit Commissioning Report	Preparing and submitting of report at the end of the commissioning process.
5	1.8.3	Obtain Approval to Close Project	Obtaining formal approval form
6	1.1.4	Project Charter	Establishing parameters and or requirements for developing the Project Charter.
6	1.2.4	Establish Project Team	Selecting individual to form part of the design and project Implementation team.
6	1.3.4	Schematic Proposal and Design Adjustments	Developing design concept into schematic drawings using standards and functional space requirements.
6	1.4.4	Compile tender Packages	Putting together all construction and consultants' drawings, Specifications, and all

WBS DICTIONARY			
Project Number	2031	Project Name	Project Manager
		Design and Construction of the Center for Adolescent Renewal and Education	Lyndon B Georges
Level	WBS code	Work Package	Description of works
			accompanying tender requirements as per Public Procurement and Asset Disposal Act. -Procurement of Services. Packages must be sealed and addressed accordingly.
6	1.5.4	Site Preparation	Preparing the site (clearing, grading of land, compacting soil, installing temporary services, signage etc.) for future construction work.
6	1.6.4	Obtain Certificate of Occupancy	Obtaining certificate deeming that project has been completed and safe to occupy.
6	1.8.4	Contractor Demobilization	Removing all things (temporary facilities, equipment, personnel etc.) forming part of contractor mobilization. Restoring of site as required in contract.
7	1.1.5	Communication Plan	Developing and formalizing a plan that informs how information will be communicated and distributed to stakeholders throughout the project.
7	1.2.5	Feasibility Study and Report	A comprehensive assessment to examine technical, environmental, financial, legal, economic, social aspects associated with the project and its proposed location. Generate a report to summarize the activity, its merits and validity and identifying whether the project is feasible, cost-effective, and profitable or not.
7	1.3.5	Presentation No.2 and Stakeholder feedback	Presentation of schematic drawings and obtain feedback on the same.
7	1.4.5	Submission and Receipt of Tender packages	In person collection of tender packages to bidders and receipt of sealed completed packages on stipulated date.
7	1.5.5	Foundation	All construction and site preparation interventions relevant to construction of the buildings substructure (foundation).
7	1.6.5	Issue Final request for Payment	Quantity Surveyors will compile final payment certificates for approval by Chief Architect and Relevant head of department and onward forwarding to accounts section for payment.
7	1.8.5	Issue Final Completion Documents	Prepare and issue satisfactory completion certificate.

WBS DICTIONARY			
Project Number	2031	Project Name	Project Manager
		Design and Construction of the Center for Adolescent Renewal and Education	Lyndon B Georges
Level	WBS code	Work Package	Description of works
8	1.2.6	Conduct Repertoire studies	Realize local, regional, and international studies of projects of a similar nature within a comparable urban environment for assessment of design solutions and initiatives.
8	1.3.6	Final Proposal and Revised Budgetary Costing	Incorporate all agreed design changes and develop a final design proposal for the proposed project and a corresponding revised Budgetary costing.
8	1.4.6	Evaluation of tenders	Approved evaluation team engages in a few days of group evaluation of all tender submissions for the project.
8	1.5.6	Concrete Works-Ground Floor	All activities preceding and leading to the pouring of concrete as per engineering specification for the designed structural component.
8	1.8.6	Project Handover	Prepare and have ready for signing, The Taking over Certificate. Handing over of all keys and items required for managing the daily functioning of the building.
9	1.3.7	Presentation No.3 and Stakeholder feedback	Presentation of final design drawings and detailed perspectives and obtain feedback on the same.
9	1.4.7	Approval of winning bidder	Obtain approval memo from Department of finance to formalize consent of winning bidder and proceed to contracting.
9	1.5.7	Block and Masonry Work	Laying bricks, block, stones using sand/cement mortar as per engineering specifications.
10	1.3.8	Coordinate Consultancy Services.	Coordinates and inspects the work of external consultants, by undertaking technical evaluation of submissions and physical work to ensure final design and specifications adhere to project deliverables.
10	1.4.8	Contracting	Awarding of contracts and facilitating the signing and distribution of the same in compliance with policies, standards, and regulations.
10	1.5.8	Carpentry and Joinery Work	Carrying out skilled work, primarily using timber products, to creating and installing building components.

WBS DICTIONARY			
Project Number	2031	Project Name	Project Manager
		Design and Construction of the Center for Adolescent Renewal and Education	Lyndon B Georges
Level	WBS code	Work Package	Description of works
11	1.3.9	Prepare Construction and Approval set of drawings.	Develop and compile architectural, and consultants' drawings and specifications for approval by statutory agencies.
11	1.4.9	Closure of Procurement Phase	Closure of procurement for construction services by lead personnel.
11	1.5.9	Roofing	Installation of rafters, trusses, form work for pouring concrete roof sections and concrete roof shading elements
12	1.3.10	Statutory Approvals and building permits	Submission of required application documents and accompanying drawings to approval agencies for receipt of building permits in varying disciplines.
12	1.5.10	Windows, Walls, and Shopfront Closures	Install windows, shopfronts and realize corrections and finishes to walls in corresponding areas.
13	1.3.11	Develop final Bill of Quantities	Realize detailed list of materials, equipment, components, and labor required to complete a construction project and corresponding costs for every activity.
13	1.5.11	Building Finishes- Interior, Exterior	Plastering, pointing, painting, varnishing, tile grouting, electrical faceplates, telecommunication faceplates etc.
14	1.5.12	Mechanical, Electrical, Plumbing (MEP) Installations	Installation of all MEP infrastructure and components for the building in compliance with policies, standards, and regulations.
15	1.5.13	Heating, Ventilation, & Air Conditioning (HVAC) Installations	Installation of all HVAC infrastructure and components for the building in compliance with policies, standards, and regulations.
16	1.5.14	Landscaping and Groundwork	Modifications to terrain to create walkways, planters, flower gardens etc. as per landscape design.
17	1.5.15	Post Construction Clean-up	Final clean-up after completion of all construction activities.

4.2.7 Validate Scope

The project manager and his project team will use the Work Breakdown Structure (WBS) as the statement of works. The WBS dictionary will guide in defining the work to be implemented or performed while the project manager will ensure that the contractor, consultants, and project team, realize only work stated in the WBS and their corresponding deliverables, unless formally directed to effect changes. The project manager will oversee the development of the project and ensure that deliverables are completed satisfactorily and have been formally accepted by the sponsor.

A combination of scheduled virtual bi-weekly meetings between the project manager, chief architect, project architect (s), team leaders and key stakeholders will be used to validate deliverables for formal acceptance. Customary use of photos and videos are essential to elaborate on deliverables and challenges associated with achieving them.

While implementing the project the project manager will verify interim deliverables at the end of each work process against the original project scope and grant provisional acceptance to deliverable(s) once completed for review. Upon verification that deliverables satisfy requirements, as defined in the project plan, a meeting will be held with the chief architect for confirmation, acceptance and signoff of deliverable for documenting and accountability purposes. Items failing to meet specifications will be reassessed by responsible teams and resubmitted to the project manager for reconsideration and discussion.

Scope Verification and Validation

Introduction

The scope verification and validation process for the design and construction of the Center for Adolescent Renewal and Education will be used to review all deliverables and perform all quality control inspections during and upon finalization of work packages in order to receive formal acceptance to ensure satisfactory completion of deliverables and that the deliverables meet the requirements and specifications as defined in the approved scope. Chat No. 15 below, depicts the Scope Verification and Validation Template for the design and construction of the Center for Adolescent Renewal and Education and for use by responsible party/parties.

Chart No. 15 Scope Verification and Validation Template e.g. (Source: Georges, L.B.,

Author, May 2023)

Scope Verification and Validation

Project Name	Design and Construction of the Center for Adolescent Renewal and Education	Date:	
Project Number	2031	Document Number	SVV-ASEC-001
Project Manager	Project Architect	Lead Assistant	Contractor
Lyndon B Georges	Florencius Eudovique		

WBS Code	Work Package / Deliverable(s)	Inspection Results	Variation
1.5.4	Site Preparation		
- 1.5.4.1	<ul style="list-style-type: none"> Install temporary power 		
- 1.5.4.2	<ul style="list-style-type: none"> Install temporary water service. 		
- 1.5.4.3	<ul style="list-style-type: none"> Set up site office 		
- 1.5.4.4	<ul style="list-style-type: none"> Set line and grade benchmarks 		
- 1.5.4.5	<ul style="list-style-type: none"> Temporary fencing and signage 		
Date:	Signed	Project Architect	Provide documented detail of the above.
Date:	Approved	Chief Architect	
1.5.5	Foundation		
- 1.5.5.1			
- 1.5.5.2			
-			
	Signed	Project Architect	Provide documented detail of the above.
	Approved	Chief Architect	

Approved by:



Lyndon B Georges

Chief Architect

Department of Physical Development & Urban Renewal

Date: March 4th, 2023

4.2.8 Control Scope

Control scope is the process of monitoring the status of the project and product scope and managing changes to the scope baseline. The key benefit of this process is that the scope baseline is maintained through the project (PMBOK®Guide, 2017).

For the design and construction of the Center for Adolescent Renewal and Education, the project manager will manage and control scope implementation, firstly, by instructing project team to conduct daily checks of deliverable stages and documenting the outcomes through the preparation of reports or using checklists. The team at the design stage will execute design tasks and at the implementation stage will provide supervisory oversight guided by the project manager for realization of tasks as outlined in the WBS dictionary. The project manager will provide bi-weekly project status reports to the chief architect who will approve and forward them to the project sponsor and heads of departments for information purposes. The reports contain information on expenditure, project variances requiring attention and compliance with requisite standards and specifications.

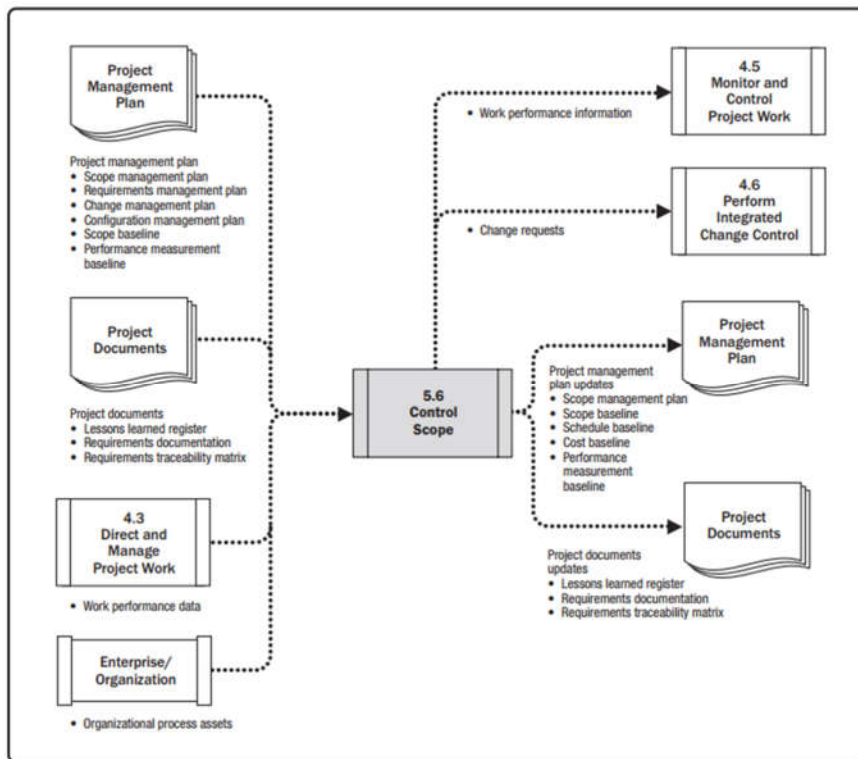
In the event of possible scope changes due to unforeseen or sponsor / stakeholder requests, a formal change request must be submitted using the Change Request Template in Chart No. 9 as part of integrated change control process for the project. The project manager will review and evaluate requested scope change with specialist team members and make a recommendation. The chief architect will then receive the change request and can either reject it if it does not apply to the intent of

the project or convene a change control meeting between the project manager, project sponsor and key stakeholders to review the change request further and perform an impact assessment of the change before approving.

If the change has been approved the project manager will formally accept the change by signing the document. Upon acceptance of the change the project manager will update all project documents and communicate the change to all project team members. The project manager will keep a record of all change requests.

The data flow diagram for controlling scope is depicted below in Figure 22


Figure 22 Control Scope Data Flow Diagram



Note. From Project Scope Management, PMBOK®Guide 6th edition, p.168. Copyright 2017 by PMI.

4.2.1 Scope Management Plan Approval

The signatures of the people below indicate an understanding in the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.3 SCHEDULE / TIME MANAGEMENT PLAN

Schedule Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

According to PMBOK®Guide, PMBOK®Guide, 6th edition (2017), The Project Schedule

Management processes are defined as:

- Plan Schedule Management
- Define Activities
- Sequence Activities
- Estimate Activity Durations
- Develop Schedule
- Control Schedule

The Roles and responsibilities for controlling schedule is depicted below in Chart No.16

Chart No. 16 Roles and Responsibilities

Roles/Name	Responsibilities
Project Sponsor	In collaboration with the Project Manager and Project Architect, the Project Sponsor is responsible for verifying the project schedule and project management plan for insight into and feedback on the same. He also provides general oversight on finances and budget scheduling during the initial stages of the project.
Project Manager/ Chief Architect	The project manager is responsible for work facilitation, package definition and sequencing, estimation duration, and resource assignment with and within the project team.
Project Architect	<ul style="list-style-type: none"> • Responsible for conceptual Design development and management of the works design team. • Responsible for updating Chief Architect periodically on progress or works.
Project Team	responsible for the preparation of all required documentation that accompanies the schedule management. They are active critics in the review process of the ongoing schedule.
International Labour Organization	Sponsors' representative providing integral oversight and input in the development of the schedule, financial disbursement to finances ministry from donor agency and maintains a lead supervisory role throughout the project's lifecycle.
CARE	Prime client and Owner of the vocational project responsible for reviewing the schedule and ensuring alignment to their vision.
Ministry of Education	Client Ministry with overall responsibility for the Project initiative.
Governmental Statutory Agencies.	Responsible for the approval of proposed developments and issuing of building permits.
Contractors	Responsible for performing the implementation and construction duties according to the schedule.

4.3.1 Plan Schedule Management

The Schedule Management Plan is an integral component for the design and construction of the Center for Adolescent Renewal and Education. It benefits the project because it provides direction and guidance on the management of the deliverable timelines throughout the project's life cycle. It also assists in keeping project team, sponsors and key stakeholders informed of scheduled activities and project progress.

According to PMBOK®Guide, 7th edition 2021, the schedule management plan is a component of the project and program management plan that establishes the criteria and the activities for developing, monitoring, and controlling the schedule.

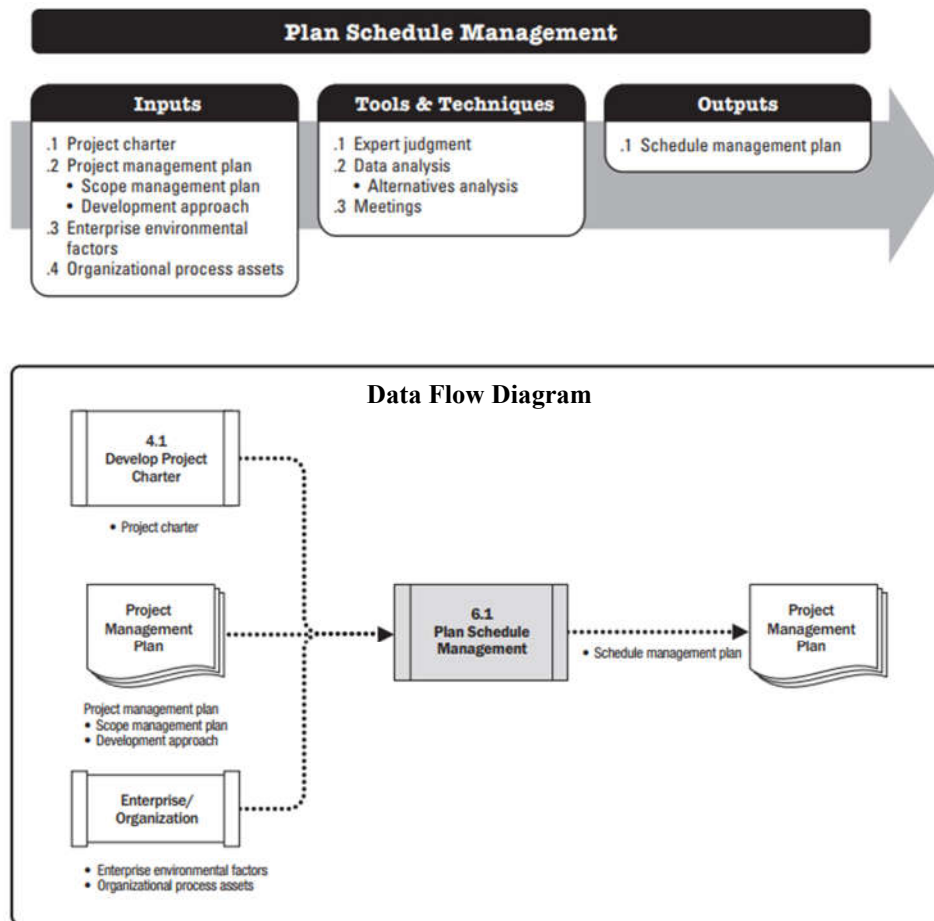
The PMBOK guide 6th Edition, 2017, describes Plan Schedule Management as processes of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule.

Preparing the Project Schedule will require the project manager to utilize the Project Charter, Scope Management Plan, organizational process assets and environmental factors to guide its development. The schedule management process must be done in collaboration with the established schedule agreed to by the consultants and contractors as per contractual obligations. The tool used to capture the information is Microsoft Project Professional 2021 scheduling software.

The inputs, tools & techniques, and outputs as well as the data flow diagram for controlling Plan Schedule Management is depicted below in Figure 23

Figure 23 Create WBS: Inputs, Tools & Techniques, and Outputs and Data

Flow Diagram



Note. From Project Schedule Management, PMBOK®Guide 6th edition, p.179. Copyright 2017 by PM

4.3.2 Define Activities

According to PMBOK®Guide, 6th edition (2017), Define Activities is the process of identifying and documenting the actions to be performed to produce the project deliverables. It benefits the project by decomposing work packages into

schedule activities, that provide a basis for estimating, scheduling, executing, monitoring, and controlling project work.

To define the activities for the design and construction of the Center for Adolescent Renewal and Education the work breakdown structure, developed as part of scope management will be fundamental. The various work packages will be decomposed into sub activities allowing for ease of manageability and comprehension of the make-up of the final deliverables.

Milestones will be incorporated into the activity sequencing, for controlling the project. Said milestones are activity outputs carrying a zero duration and identifying completion of an activity or activities or the start of a new phase.

The milestone list for the project is as follows:

- Completion of Architectural Design and receipt of permits
- Completion of procurement
- Completion of foundations
- Completion of concrete floors and roof
- Completion of masonry and carpentry work
- Completion of installation of ceiling, doors, windows, and built-in furniture
- Completion of all plastering and building Finishes
- Completion of all mechanical, electrical, and plumbing Installations
- Completion of construction phase
- Project completion

4.3.3 Sequence Activities

PMBOK®Guide(2017), defines sequence activities as the process of identifying and documenting relationships among the project activities. It benefits the project by identifying the logical sequence of works necessary for obtaining the greatest efficiency, given project constraints through the project. To define the activities for the design and construction of the Center for Adolescent Renewal and Education the project manager will define the relationships between activities, creating a logical progression of events while determining their predecessors or successors' relationships. Performing this function will require considering the constraints and assumptions, likewise the WBS. This process will aid in the updating of the activity list and milestone list for the project.

4.3.4 Estimate Activity Duration

Activity duration estimate is an essential process necessary for quantifying the work periods required to complete each project activity with the estimated resources. This will be achieved with a series of project team meetings, where lessons learnt, expert judgement, data analysis based on analogous estimating and the PERT three-point estimating technique are used. Analogous estimating allows for the use of historical data from past similar projects to guide and refine the process.

PERT Three-Point estimating will be implemented as a preferred method due to uncertainties and risk associated with this project. It will assist in defining an approximate range of individual activity durations.

The 3 points of estimates for the PERT estimating technique are detailed below:

Most Likely estimate (tM) – This time estimate is based on the Most Likely duration of the activity.

Optimistic estimate (tO) – This time estimate is based on the best-case scenario for the duration of the activity, based on how many working periods are the minimum required to complete the activity.

Pessimistic estimate (tP) – This time estimate is based on the worst reasonable case scenario for the duration of the activity.

Using PERT, a probability distribution (Beta) for the duration of each was derived.

Beta (tE) provides the following formula to estimate the expected duration:

$$\mathbf{tE = (tO+4tM+tP) / 6}$$

The activity list for the design and construction of the Center for Adolescent Renewal and Education is depicted below in Chat No 17

Chart No. 17 Activity List including Duration etc. (Source: Georges, L.B, Author, May 2023)

ACTIVITY LIST						
Project Number	2031	Project Name			Project Manager	
		Design and Construction of the Center for Adolescent Renewal and Education			Lyndon B Georges	
WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.2.1	012	Client / Architect Appraisal Meeting.	Receive clients' instructions and statements of requirements to formulate and advise client on a strategic course of action.	None	2	Chief Architect, Owner/ Client
1.2.2	014	Site Familiarization, Visit and Investigation	Visit the proposed site to gather information and obtain visual characteristics of its immediate urban environment.	1.2.1	2	Chief Architect, Owner, Project manager.
1.2.3	016	Develop Project Charter	Develop a formal document that lays out the project vision, scope, objectives, project team and their responsibilities etc.	1.2.2	8	Chief Architect, Project Manager
1.2.4	018	Establish Project Team	Compile the group of individuals who will be engaged in the design and implementation of the project.	1.2.3	2	Chief Architect, Project Manager
1.2.5	020	Conduct Feasibility Study and Report	Assess the site and its urban environment to determine the practicality of the proposed project, taking into consideration all pros and cons associated with the same and generate a final report.	1.2.4	15	Chief Architect, Project Design Team

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.3.1	022	Conduct Conceptual Studies and prepare Design Solutions	Develop project brief and explore studies illustrating spatial relationship, massing, and circulation and services systems.	1.2.5	20	Chief Architect, Project Design Team
1.3.2	024	Develop Budgetary Costing	Prepare in collaboration with quantity surveyor a statement of probable cost of construction based on the conceptual design.	1.3.1	10	Chief Architect, Quantity Surveyor
1.3.3	026	Conduct Concept Presentation and Obtain Stakeholder Feedback, including change request	Conduct presentation using graphical representation of the design and receive and receive feedback from key stakeholders for possible design alterations etc.	1.3.2	4	Chief Architect
1.3.4	028	Develop Schematic Proposal and Conduct presentation No. 02	Conduct design modification as per change requests through outlined proposal and present to project stakeholders.	1.3.3	15	Chief Architect, Project Design Team
1.3.5.1	030	Realize final design and budgetary costing adjustments/modifications	Final outlined project proposal describing size and character of entire project to include architectural, engineering systems, materials, building placement on site etc.	1.3.4	20	Chief Architect, Project Design Team, Quantity Surveyor
1.3.5.2	032	Conduct Final Presentation	Graphical presentation of the finalized project.	1.3.5.1	1	Chief Architect
1.3.5.3	034	Coordinate Consultancy Services	Contract consultants and collaborate to prepare full coordinated set of architectural and engineering drawings, schedules, and specifications for tender processes.	1.3.5.2	6	Chief Architect, Project Management Team
1.3.5.4	036	Prepare Construction set of drawings	The design team prepares and collates the set of drawings to guide the building construction and for use to obtain building permits.	1.3.5.3	55	Chief Architect, Project Design Team
1.3.6.1, 1.3.6.2, 1.3.6.3,	038-046	- Secure SLSWM (St. Lucia Solid Waste Management)	Make submission of documents and construction drawing to statutory bodies for approval and building permits.	1.3.5.4	7 7 10	Chief Architect, Project Design Team

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.3.6.4, 1.3.6.5, 1.3.6.6		<ul style="list-style-type: none"> - Secure Infrastructural Permit - Secure Public Health Permit - Secure Fire Safety & Prevention Permit - Secure DCA (Development Control Authority) Permit 			7 10	
1.3.7	048	Develop final bill of quantities	Prepare a statement of cost of construction using the construction set of drawings and specifications.	1.3.6.1, 1.3.6.2, 1.3.6.3, 1.3.6.4, 1.3.6.5, 1.3.6.6	20	Chief Architect, Quantity Surveyor
1.3.8	050	Completion of architectural design and receipt of permits	Milestone		0	
1.4.1.1	052	Issue notice of expression of interest	Advertise in the national gazette a notice of expression of interest to tender on the construction of the project.	1.3.7	4	Chief Architect, Quantity Surveyor
1.4.1.2	054	Receipt bidder packages	Receive sealed packages from interested bidders with requisite information as per 1.4.1.1.	1.4.1.1	1	Central Procurement division
1.4.1.3	056	Conduct pre-qualification exercises	Evaluation team to open individual bids and assess validity of information provided against the requirements of the Procurement and Stores Act for this intervention.	1.4.1.2	5	Tender Evaluation Team
1.4.2.1	058	Prepare request for proposal and collate supporting documents	Collate tender documents, and construction drawings to enable tenders to be placed and provide information for preparation of pre-tender cost estimates.	1.4.1.3	8	Chief Architect, Quantity Surveyor
1.4.3	060	Submission and receipt of proposal	Submit tender packages to bidders and receive completed packages on the stipulated date and time.	1.4.2.1	42	Chief Architect Bidders, Quantity Surveyor

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.4.4.1	062	Consider and conduct evaluation of financial proposals and select successful proposal	Evaluation team evaluates bid submissions and selects a qualifying bidder.	1.4.3	10	Tender Evaluation Team
1.4.4.2	064	Prepare evaluation report	Prepare a detailed statement on the evaluation methodology used and the justification for the winning bidder.	1.4.4.1	4	Tender Evaluation Team
1.4.4.3	066	Submit report to Public Procurement Board	Submit evaluation report and all supporting appendices.	1.4.4.2	2	Chief Architect, Tender Evaluation Team
1.4.5.1	068	Schedule Public Procurement Board meeting	Schedule meeting to discuss evaluation report and winning bidder.	1.4.4.3	2	Chief Architect
1.4.5.2	070	Presentation of evaluation report	Present report to Procurement Board.	1.4.5.1	1	Chief Architect
1.4.5.3	072	Receipt of formal approval letter	Receive approval letter to proceed to negotiations and contracting from Central Procurement Unit.	1.4.4.2	3	Central Procurement Division
1.4.5.4	074	Negotiation of successful proposal	Negotiate a reduced construction cost with winning bidder.	1.4.4.3	6	Chief Architect, Quantity Surveyor
1.4.8.1	076	Review and collate contract documents	Vet and collate construction contract.	1.4.5.4	3	Chief Architect, General Contractor, Legal Officer, Quantity Surveyor
1.4.8.2	078	Award and signing of contract	Award and signing of contract by relevant parties.	1.4.8.1	1	Chief Architect, General Contractor, Quantity Surveyor
1.4.8.3	080	Conduct public awareness exercise	Conduct townhall and constituency meeting as well as media broadcasts to engage and inform the public and neighboring communities of the proposed project intervention.	1.4.8.2	4	Chief Architect, Owner, Local Media

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.4.8.4	082	Completion of Procurement	Milestone		0	
1.5.1	084	Contractor mobilization	Allowing a time period before commencement of construction activities for contractor to mobilize all material, plant, and equipment.	1.4.8.3	15	Chief Architect, General Contractor, Project Manager
1.5.2.1	086	Survey and measure road	Surveyor establishes reference parameters for road.	1.5.1	2	Chief Architect, Civil/Structural Engineer, General Contractor
1.5.2.2	088	Excavate existing road drain and secure precast concrete culverts.	Remove topsoil, silt, and debris from drain up to solid ground and place reinforced concrete culverts.	1.5.2.1	5	Civil/Structural Engineer, Clerk of Works, Project Manager, Site Excavation Contractor, Site Supervisor.
1.5.2.3	090	Pour and grade sub-base and compact.	Pour sub-base material and grade to obtain a level road surface and compact as per engineering specifications.	1.5.2.2	2	Civil/Structural Engineer, Clerk of Works, General Contractor, Project Manager.
1.5.2.5	092	Test road surface	Conduct vehicular traffic test over newly built road to assure it meets required standards.	1.5.2.3	2	Civil/Structural Engineer, General Contractor, Project Manager, Project Architect.
1.5.1.1	094	Install temporary potable water and electricity.	Electrical and water service providers conduct installation of temporary services for construction phase.	1.5.1.1	2	Water Company, Electric Company

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.5.1.2	096	Set up site office	Build or transport in place site office for managing construction activities.	1.5.1.2	5	General Contractor
1.5.1.3	098	Set out building and grade benchmarks	Survey and place batter boards to establish reference points for building placement and commence ground grading as necessary.	1.5.1.3	4	General Contractor
1.5.1.4	100	Prepare site - lay down yard and temporary fencing	Establish building, plant, equipment, and traffic circulation zones on site and construct protective fencing with placement of all required signage.	1.5.1.3	5	General Contractor
1.5.4.1	102	Excavate foundations and dispose of excavated material	Excavation of all building foundation zones to required depth and dispose of excavated material in waterlogged zone on site.	1.5.1.4	7	Site excavation contractor, General Contractor
1.5.4.2	104	Realize termite treatment	Treatment of ground for termites.	1.5.4.1	3	General Contractor, Pest Control Specialist
1.5.4.3	106	Prepare and place sawn formwork and install rebar for in-ground beams and strip footings	Measure, prepare, and place formwork to receive structural reinforcement for casting ground beams as per engineering specifications.	1.5.4.2	10	General Contractor, Site Supervisor
1.5.4.4	108	Pour concrete for foundations and ground beams	Concrete is transported to site and poured in place for foundations and ground beams	1.5.4.3	3	Civil/Structural Engineer, General Contractor.
1.5.4.5	110	Perform foundation inspection	Conduct rebound hammer test or similar inspections on cured concrete foundations to assure they meet required standards.	1.5.4.4	2	Civil/Structural Engineer, Clerk of Works, Project Manager.

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.5.4.6	112	Place hardcore filling and lay damp proof membrane	Transport to site and dump and place specified hardcore material within enclosed foundation zone, compacting as specified and finishing with placement of the damp proof membrane.	1.5.4.5	3	General Contractor
1.5.4.7	114	Completion of Foundations	Milestone		0	
1.5.5.1	116	Prepare and place sawn formwork to sides of ground beams and strip footing.	Secure formwork to constructed ground beams and reference height of structural floor around entire building enclosure.	1.5.4.6	3	General Contractor
1.5.5.2	118	Install rebar mesh fabric reinforcement, and in-floor utilities (including mechanical, electrical, plumbing) for ground floor slab	Install all structural reinforcement as per engineering specification and all mechanical, electrical, and plumbing infrastructure.	1.5.5.1	3	Electric Contractor, General Contractor, Plumbing Contractor
1.5.5.3	120	Pour and cure ground floor slab	Transport concrete and pour in place as per specifications and allow to cure for specified time period.	1.5.5.2	2	General Contractor, Civil / Structural Engineer, Clerk of Works, Site Supervisor
1.5.5.4	122	Strip forms from ground floor	Remove all formwork when concrete has cured.	1.5.5.3	2	General Contractor
1.5.5.5	124	Prepare and place sawn formwork to sides of roof slab including all canopies and parapets	Secure and strut formwork to constructed ream beams or blockwork and reference height of structural roof slab, canopies, and parapets.	1.5.5.4	3	General Contractor
1.5.5.6	126	Install rebar mesh fabric reinforcement, and in-slab utilities (including mechanical, electrical, plumbing) for roof slab	Install all structural reinforcement as per engineering specification and all mechanical, electrical, and plumbing infrastructure.	1.5.5.5	4	Electric Contractor, General Contractor, Plumbing Contractor
1.5.5.7	128	Pour and cure roof slab, canopies, and parapets.	Transport concrete and pour in place as per specifications and allow to cure for specified time period.	1.5.5.6	2	Civil / Structural Engineer, Clerk of

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
						Works, General Contractor
1.5.5.8	130	Strip forms from roof slab.	Remove all formwork when concrete has cured.	1.5.5.7	2	General Contractor
1.5.5.9	132	Perform ground floor, roof slab, canopies, and parapets inspection	Conduct rebound hammer test or similar inspections on cured concrete.	1.5.5.8	2	Civil / Structural Engineer, Clerk of Works, Electrical Consultant, Mechanical Consultant, Plumbing Consultant, Project Manager
1.5.5.10	134	Completion of Concrete floors and roof	Milestone		0	
1.5.6.1	136	Rough-in plumbing at toilets and masonry walls	Install or run plumbing infrastructure for toilets, as outlined on drawings.	1.5.5.9	2	Plumbing Contractor
1.5.6.2	138	Install exterior and Interior masonry work	Construct all masonry walls.	1.6.6.1	44	General Contractor
1.5.6.3	140	Construct lintels and Kickers	Construct in places lintels and kickers	1.5.6.2	15	General Contractor
1.5.7.1.1	142	Fabricate and install roof trusses and roof framing over main roof and walkways	Construct as per specifications roof trusses and hoist in place. Install roof framing in relevant areas as per drawings and specifications.	1.5.6.3	30	Civil / Structural Engineer, General Contractor
1.5.7.1.2	144	Install metal work to secure roof trusses and rafters, and pour lightweight concrete roof fill	Install all structural metal plates in respective location for securing roof trusses in place and mix and pour concrete roof filling to upper section of ream beam to upper level of roof truss.	1.5.7.1.1	2	General Contractor
1.5.7.1.3	146	Install felt seamless roofing material, flashing and metal guttering	Lay and secure in place specified roofing felt, roofing material, flashing, and guttering.	1.5.7.1.2	3	General Contractor, Roofing Contractor
1.5.7.1.4	148	Completion of masonry and carpentry work	Milestone		0	

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.5.7.2.1	155	Install suspended ceiling framing.	Setout and install suspended ceiling grid on the interior ceiling zone of buildings.	1.5.7.1.3	7	General Contractor, Carpenter / Joiner Contractor
1.5.7.3.1	152	Install door frames and make good all window openings	Install in place all door frames as per specifications and realize finishings on all window openings.	1.5.7.2.1	5	General Contractor, Carpenter / Joiner Contractor
1.5.7.3.2	154	Install doors, windows, and ironmongery hardware	Fix in place all doors and windows including hinges, locks, door stops, door sweeps etc.	1.7.3.1	4	General Contractor, Carpenter / Joiner Contractor
1.5.7.4.1	156	Install solid surfaces, prefabricated bathroom partitions and vanities	Fix in place all countertops to receive vanities and all prefabricated toilet partitions etc.	1.7.3.2	6	General Contractor, Carpenter / Joiner Contractor
1.5.7.4.2	158	Fabricate and install kitchen cabinets, storage cupboards and open shelving	Construct and install all kitchen cupboards and shelving.	1.5.7.4.1	25	General Contractor, Carpenter / Joiner Contractor
1.5.7.4.3	160	Completion of installation of ceiling, doors, windows, and built-in furniture	Milestone		0	
1.5.7.5.1	162	Plaster all walls and screed all internal floors	Using specified cement mortar mix render finish all walls and internal floors.	1.5.7.4.2	25	General Contractor, Masonry Contractor
1.5.7.5.2	164	Install ceramic floor tiling	Lay ceramic floor tile using specified bonding and finishing agent and to specified design pattern.	1.5.7.5.1	16	General Contractor, Tiling Contractor
1.5.8.1	166	Paint walls and woodwork	Apply one coat primer and two finish paint to all internal and external woodwork.	1.5.7.5.2	20	Clerk of Works, General Contractor, Painting Contractor, Project Manager
1.5.8.2	168	Install conduit at ceiling plenum space.	Run all conduits for service infrastructure in ceiling plenum.	1.5.8.1	4	Clerk of Works, Electrical Contractor, General Contractor
1.5.8.3	170	Install ceiling tiles	Fix in place all ceiling tiles	1.5.8.2	4	Carpenter / Joiner Contractor, Clerk of Works, General Contractor

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.5.8.4	172	Install hardware and accessories	Secure and fix in place all hardware and supporting accessories.	1.5.8.3	3	General Contractor
1.5.8.5	174	Pave, curb, and stripe parking lot	Construct curb wall along building exterior as per drawings and specifications and grade parking lot.	1.5.8.4	5	General Contractor, Paving Contractor, Project Manager, Site Excavation Contractor
1.5.8.6	176	Completion of all plastering and building finishes	Milestone		0	
1.5.9.1	178	Rough-in plumbing in walls, Set plumbing fixtures and trim	Install or run plumbing infrastructure through walls for sinks and trims, as outlined on drawings.	1.5.8.5	3	General Contractor, Plumbing Contractor
1.5.9.1.2	180	Tie in fire line riser and set valves	Install all fire line risers and set valves for fire suppressant system.	1.5.9.1	2	General Contractor, Plumbing Contractor
1.5.9.1.3	182	Flush test, and clean piping and fixtures	Flush test all plumbing pipes, fixtures, and systems.	1.5.9.1.2	3	General Contractor, Mechanical Consultant, Plumbing Contractor
1.5.9.2.1	184	Rough-in electrical in interior and exterior walls	Install or run all electrical infrastructure through walls as specified on drawings.	1.5.9.1.3	5	Clerk of Works, Electric Contractor, General Contractor
1.5.9.2.2	186	Pull wire in conduit and set area transformers	Pull all electrical wires through conduits and set in area transformers.	1.5.9.2.1	10	Clerk Of Works, Electric Contractor, General Contractor
1.5.9.2.3	188	Install and terminate electrical devices	Install and terminate all electrical outlets, switches, and panels etc.	1.5.9.2.2	4	Clerk of Works, Electric Contractor, General Contractor
1.5.9.2.4	190	Install light fixtures - test and clean	Install all lights and fixtures in place, test all electrical circuits and conduct final clean of installation.	1.5.9.2.3	8	Clerk of Works, Electric Contractor, General Contractor
1.5.9.2.5	192	Completion of all mechanical, electrical, and plumbing installations	Milestone		0	
		Pour concrete for driveway, parking lot and sidewalks				Civil / Structural Engineer, Clerk of

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
1.5.11.1	194		Concrete is transported to site and poured in place for driveways, parking lot, and sidewalks.	1.5.9.2.5	6	Works, Concrete Contractor, General Contractor
1.5.11.2	196	Sod and complete plantings - building exterior	Lay slabs of grass and complete planting of all flora and fauna as per landscape architecture plan.	1.5.9.2.4	5	Clerk of Works, General Contractor, Landscape Contractor
1.5.11.3	198	Completion of construction Phase	Milestone		0	
1.6.1	200	Obtain certificate of occupancy	Obtain certificate indicating building is safe for occupancy.	1.5.11.3	2	Chief Architect
1.6.2	202	Issue final completion documents including warranties	Prepare and issue to contractor successful completion letter and taking over certificate to sign off and commence defects liability period for works realized.	1.6.1	3	Chief Architect, Project Manager
1.6.3	204	Issue final request for payment	Prepare, certify, and issue final payment/ certificate to accounts debt for payment to contractor.	1.6.2	1	Chief Architect, Quantity Surveyor
1.7.1	206	Completion of works	Complete all works	1.6.3	1	Chief Architect, General Contractor, Project Manager
1.7.2	208	Dry Run/ Test run	Conducting a test run of all building, plant, and equipment for adherence to standards and safety requirements.	1.7.1	2	Chief Architect, Clerk of Works, Electrical Consultant, General Contractor, Plumbing Consultant, Project Manager
1.8.1	210	Submit final reports (commissioning, inspection, and testing) including lessons learned.	Prepare and submit final reports.	1.7.2	2	Chief Architect, Project Manager
1.8.2	212	Obtain approval to close project	Obtain written approval to close project.	1.8.1	2	Chief Architect, Project Manager
1.8.3	214	Contractor demobilization	Formal notice is delivered to clear site of all construction equipment, machinery,	1.8.2	5	Chief Architect, Project Manager

WBS Code	Activity Code	Activity Name	Activity Description	Predecessors	Duration workday(s)	Resource Requirements
			tool etc. and conduct a post construction cleaning exercise.			
1.8.4	216	Project Hand over	Formal hand over of project to client / owner.	1.8.3	1	Chief Architect, General Contractor, Project Manager
1.8.5	218	Project Completion	Milestone		0	

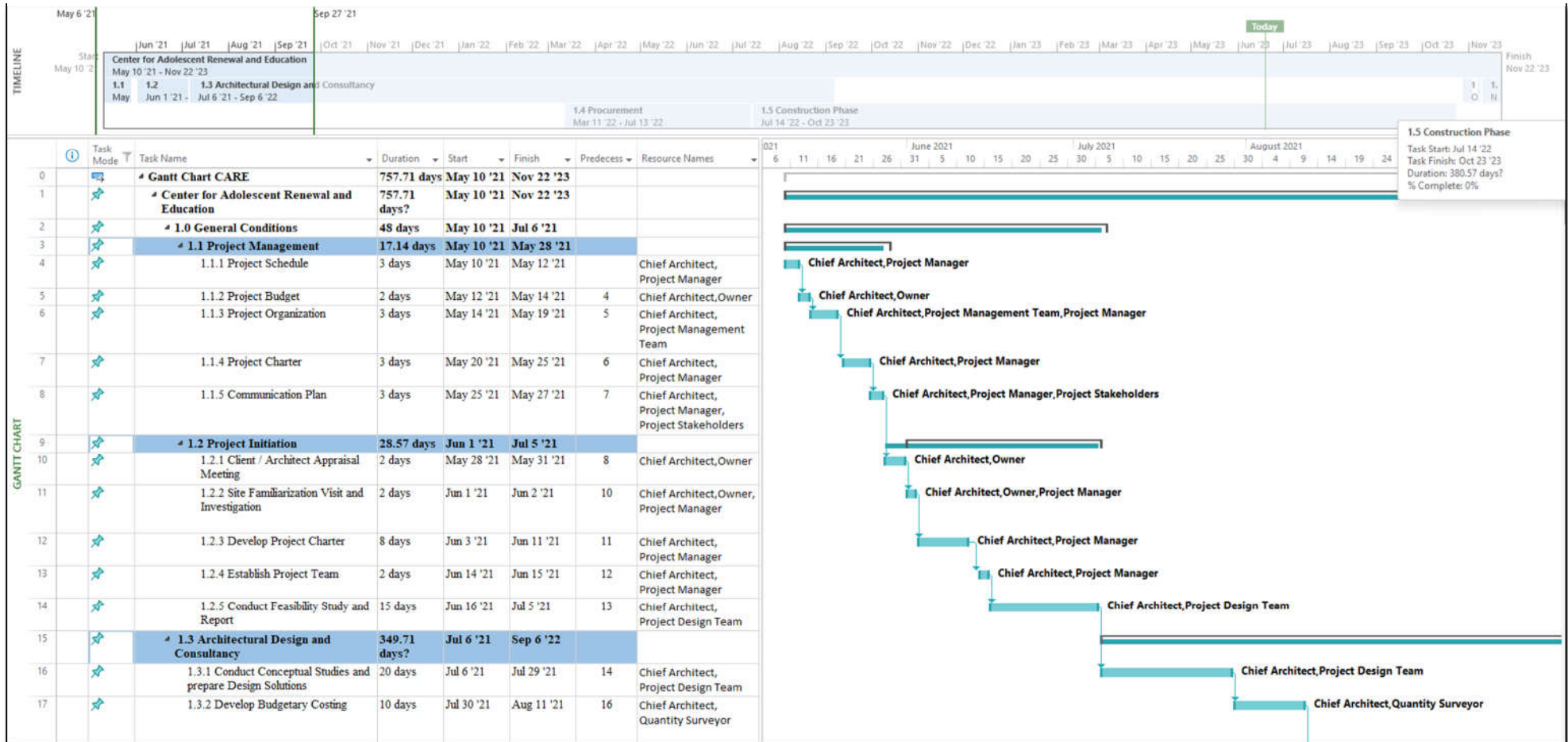
4.3.5 Develop Schedule

The schedule for the design and construction of the center for Adolescent Renewal and Education will be developed using MS Project 2021. As indicated in PMBOK®Guide, 6th edition (2017), activity sequences, durations, resource requirements and schedule constraints will be analyzed to create this project's schedule to facilitate the execution, monitoring, and control of all project activities.

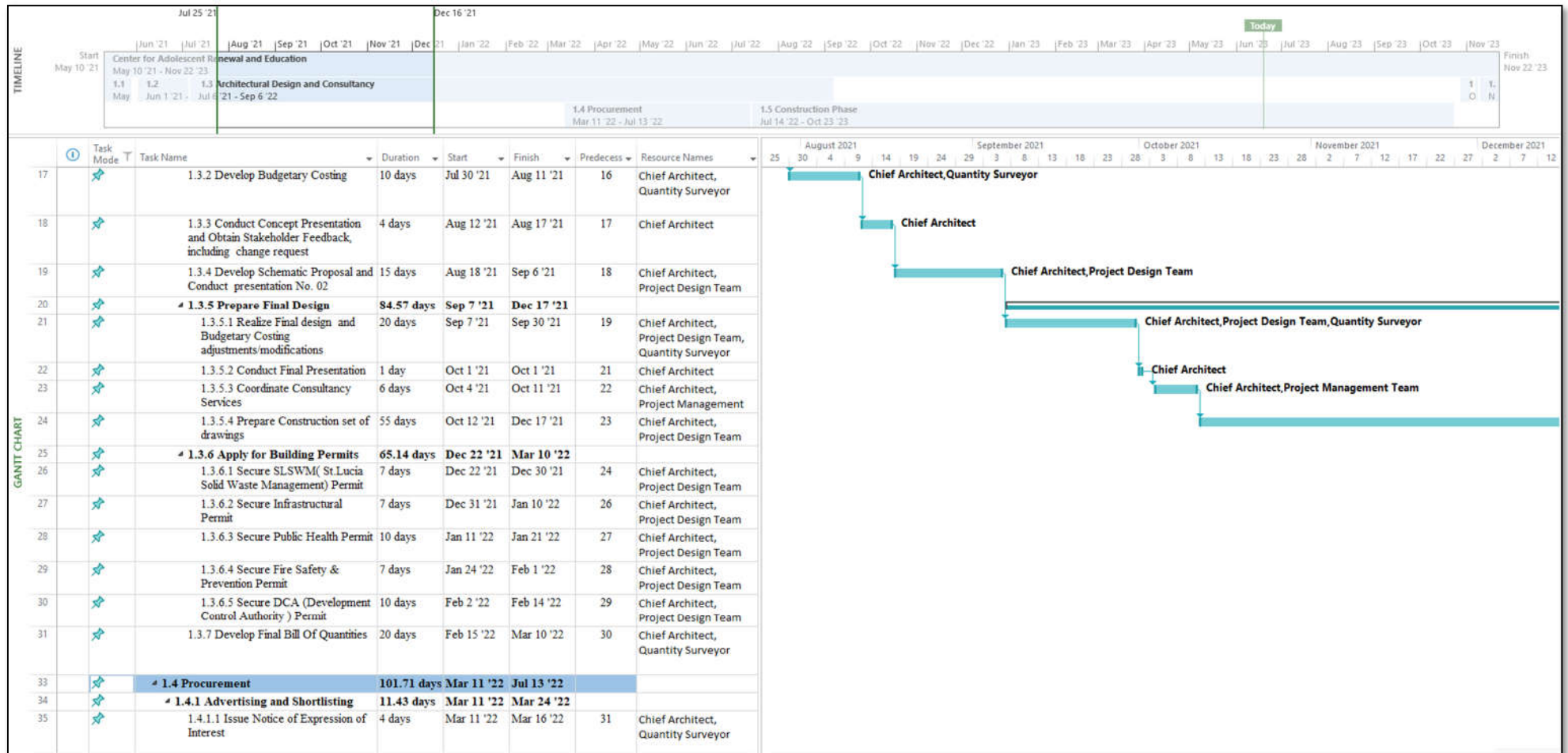
The schedule will be a useful tool for use by the project manager and project team for tracking work progress at varying stages of the project's life cycle. It outlines start and end dates and milestones to be met at varying deliverable stages for timely completion of tasks. This schedule will be used in conjunction with the work breakdown structure (WBS) for effective distribution of work among team members.

The Project Schedule for the design and construction of the center for Adolescent Renewal and education is depicted below in Chart No. 18.

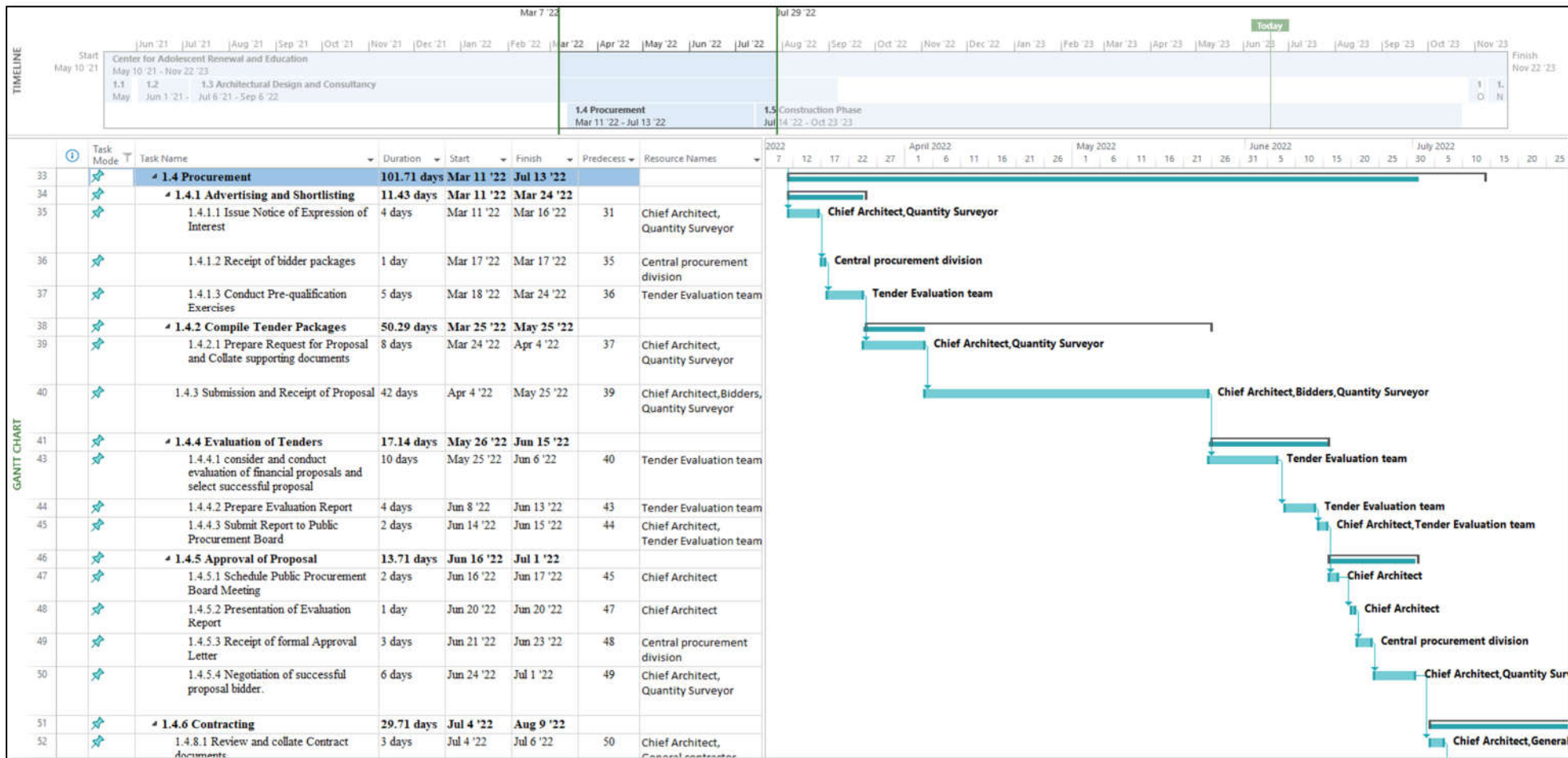
Part No. 18 Gantt Chart, Project Schedule – (Information Source: Georges, L.B, Author, June 2023)



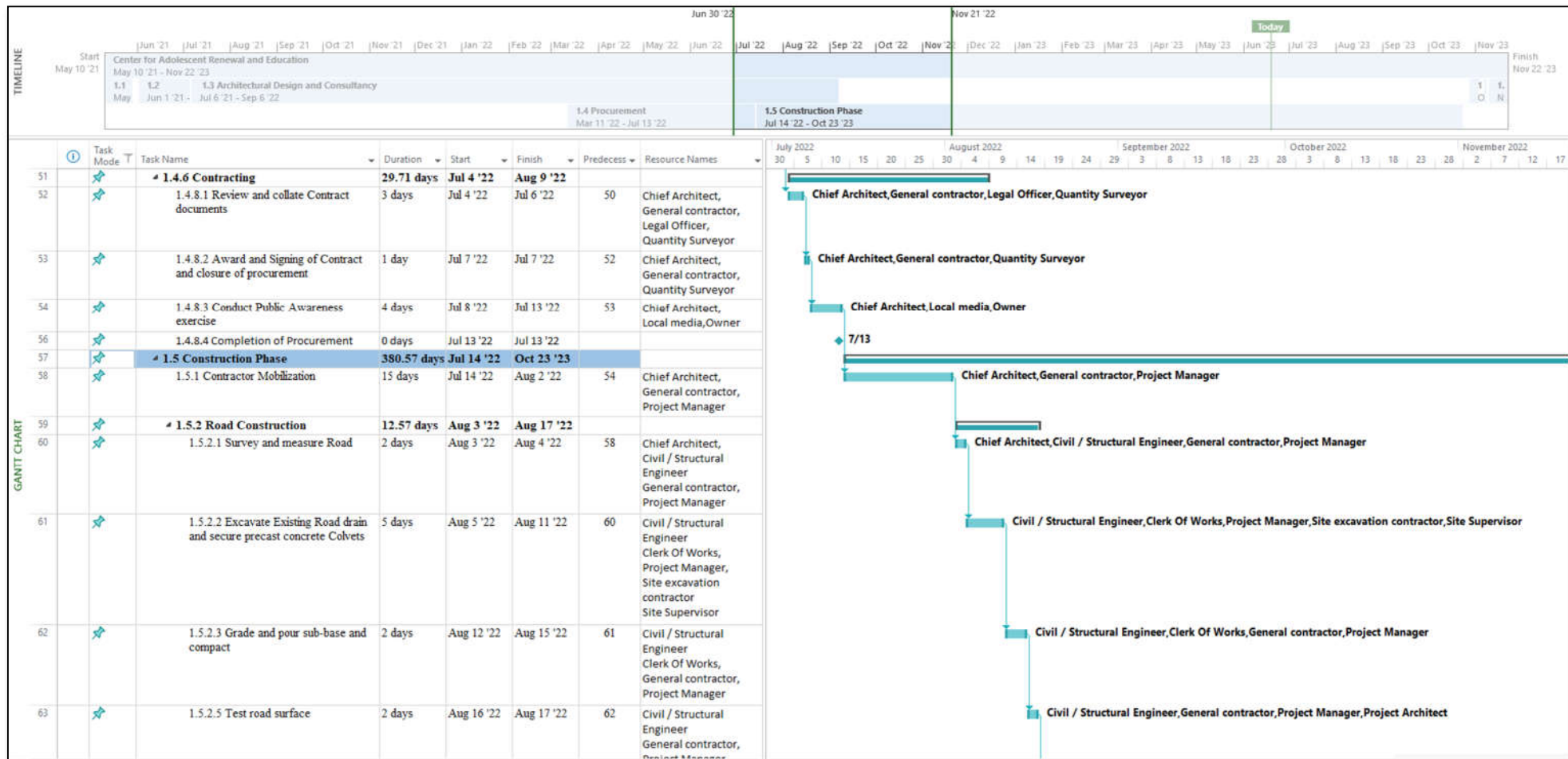
Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



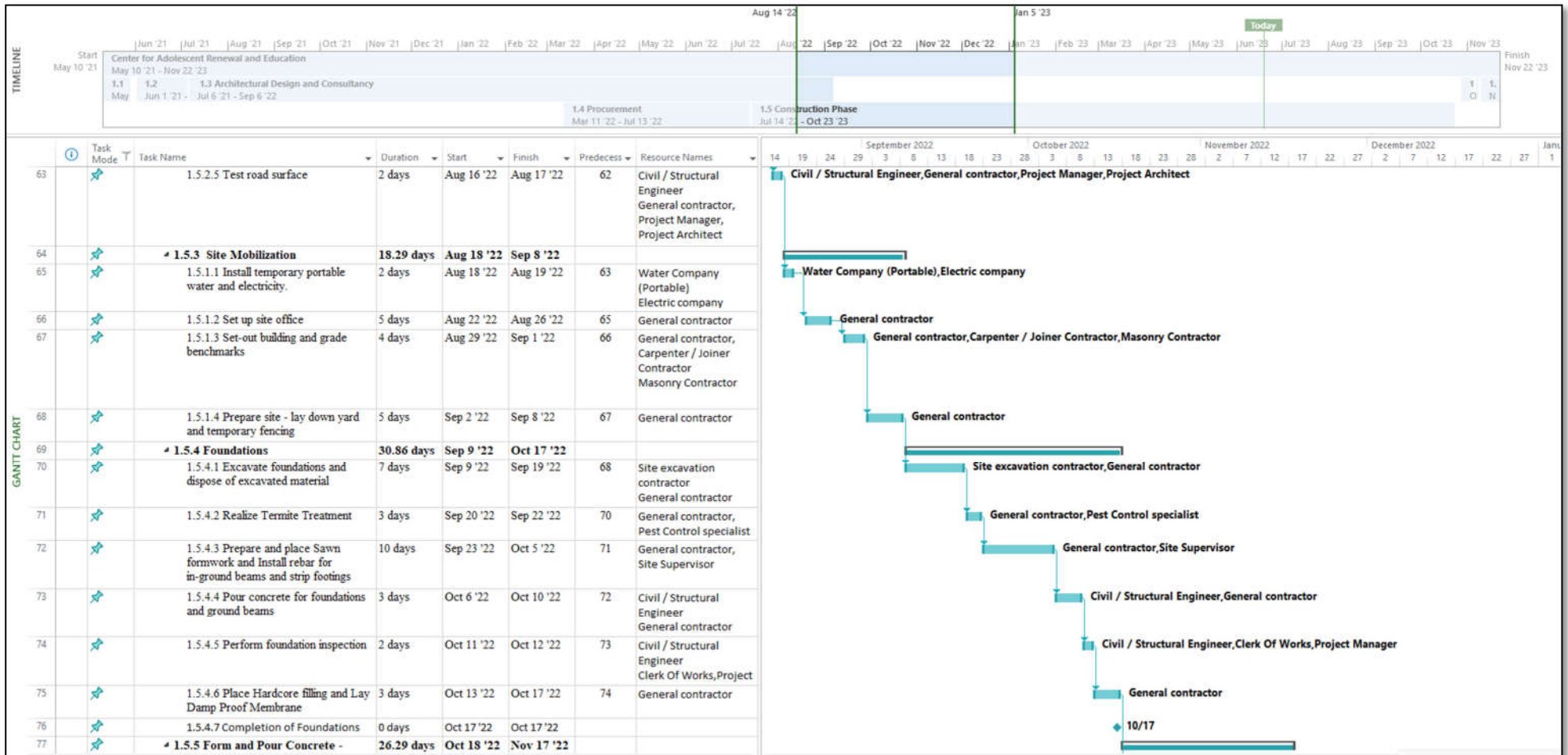
Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



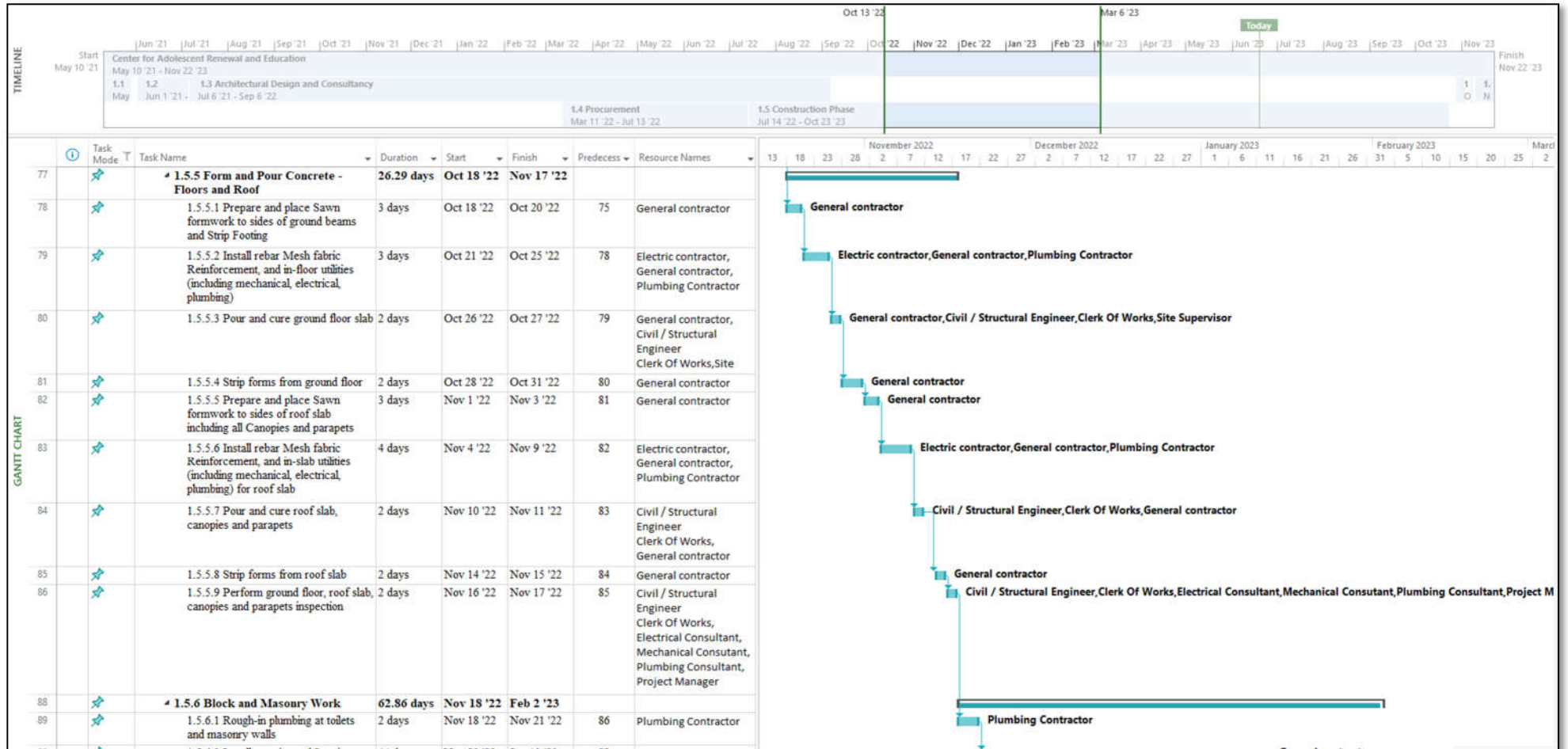
Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



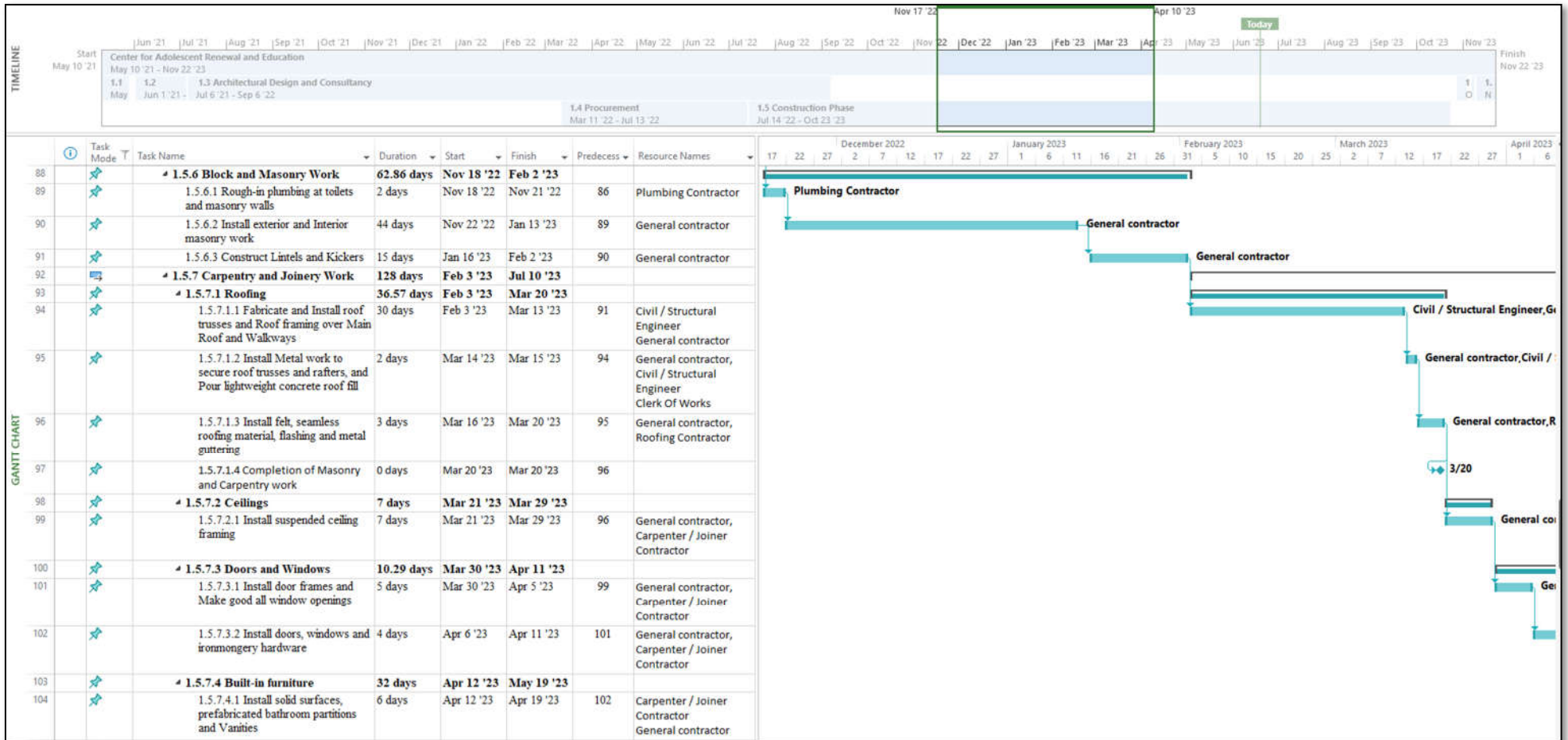
Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



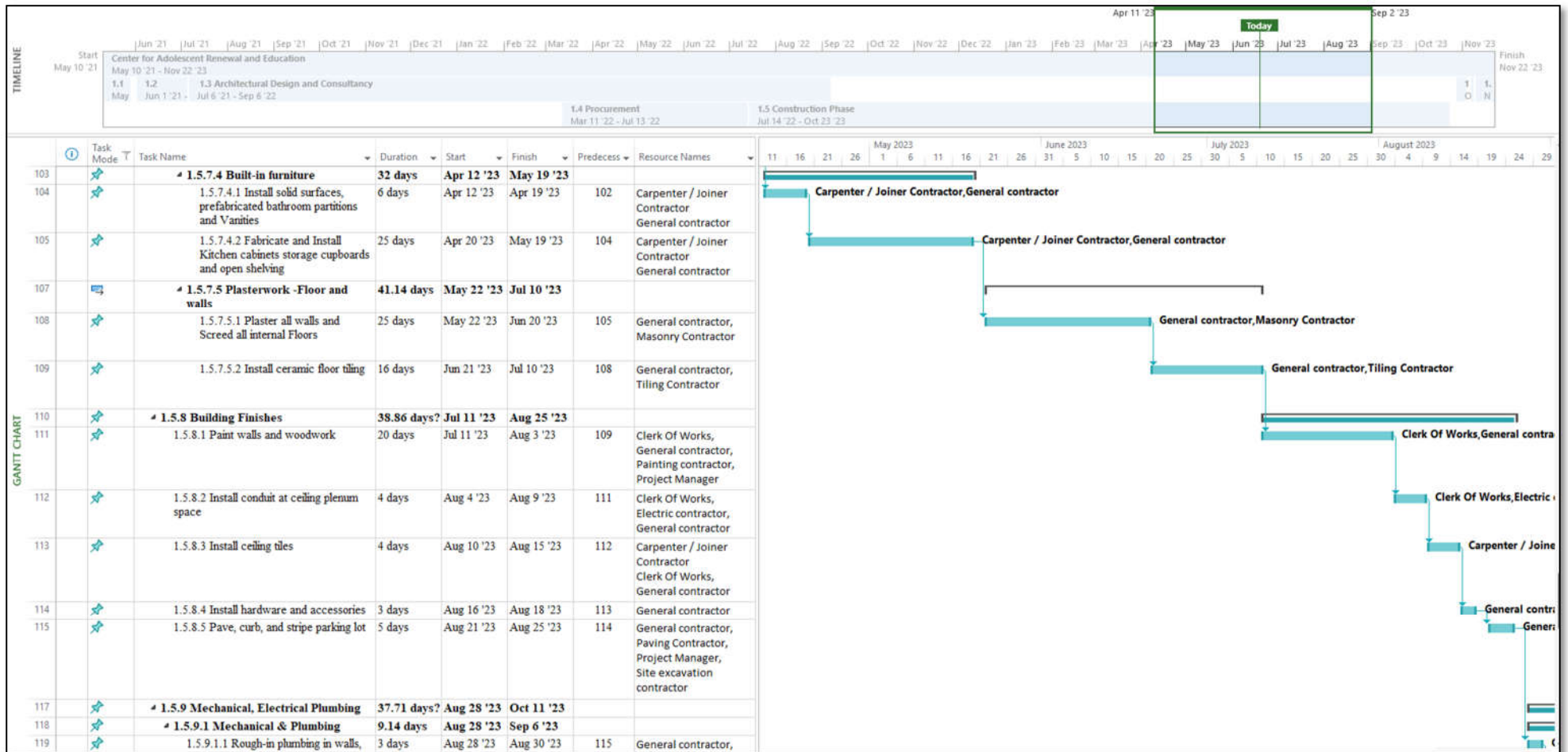
Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



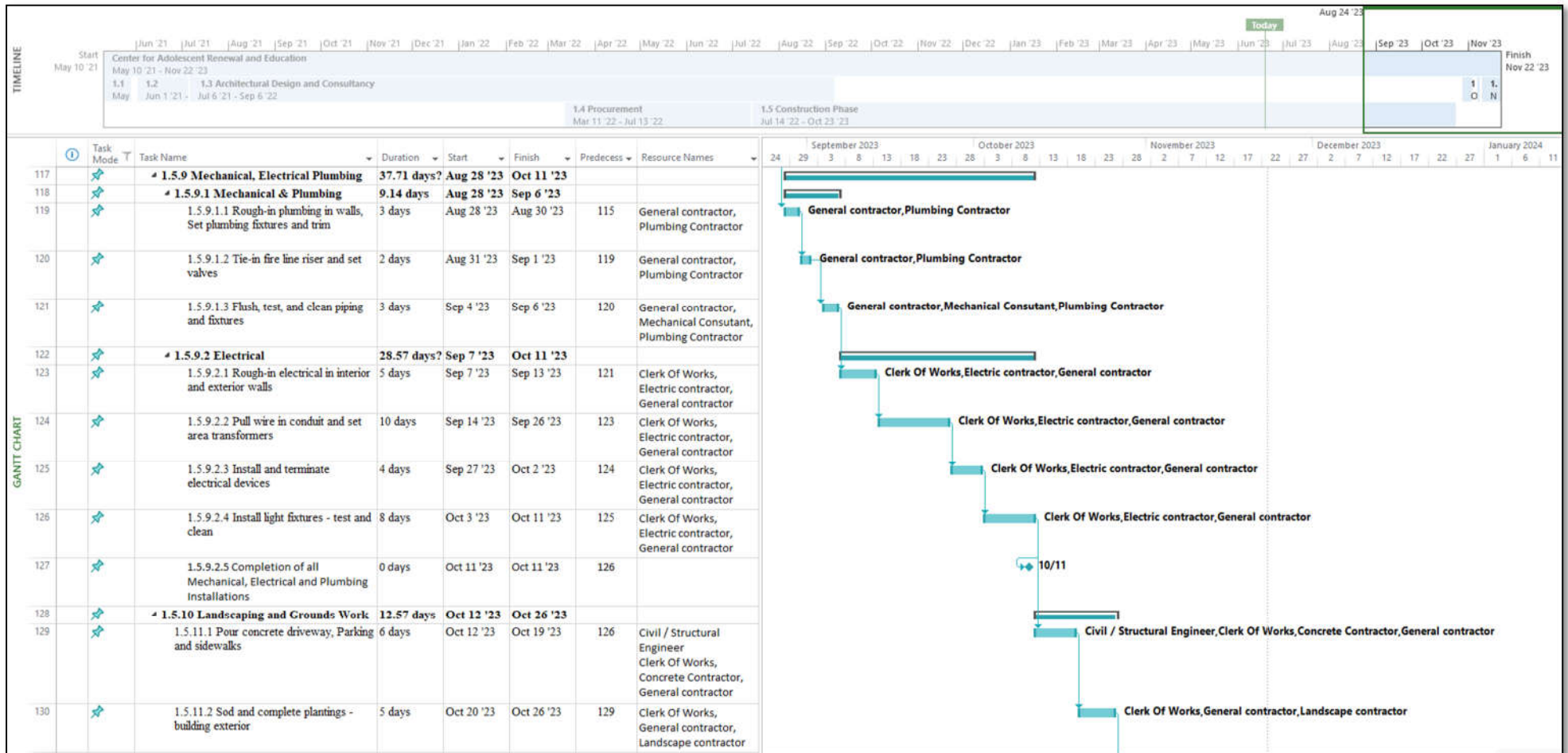
Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



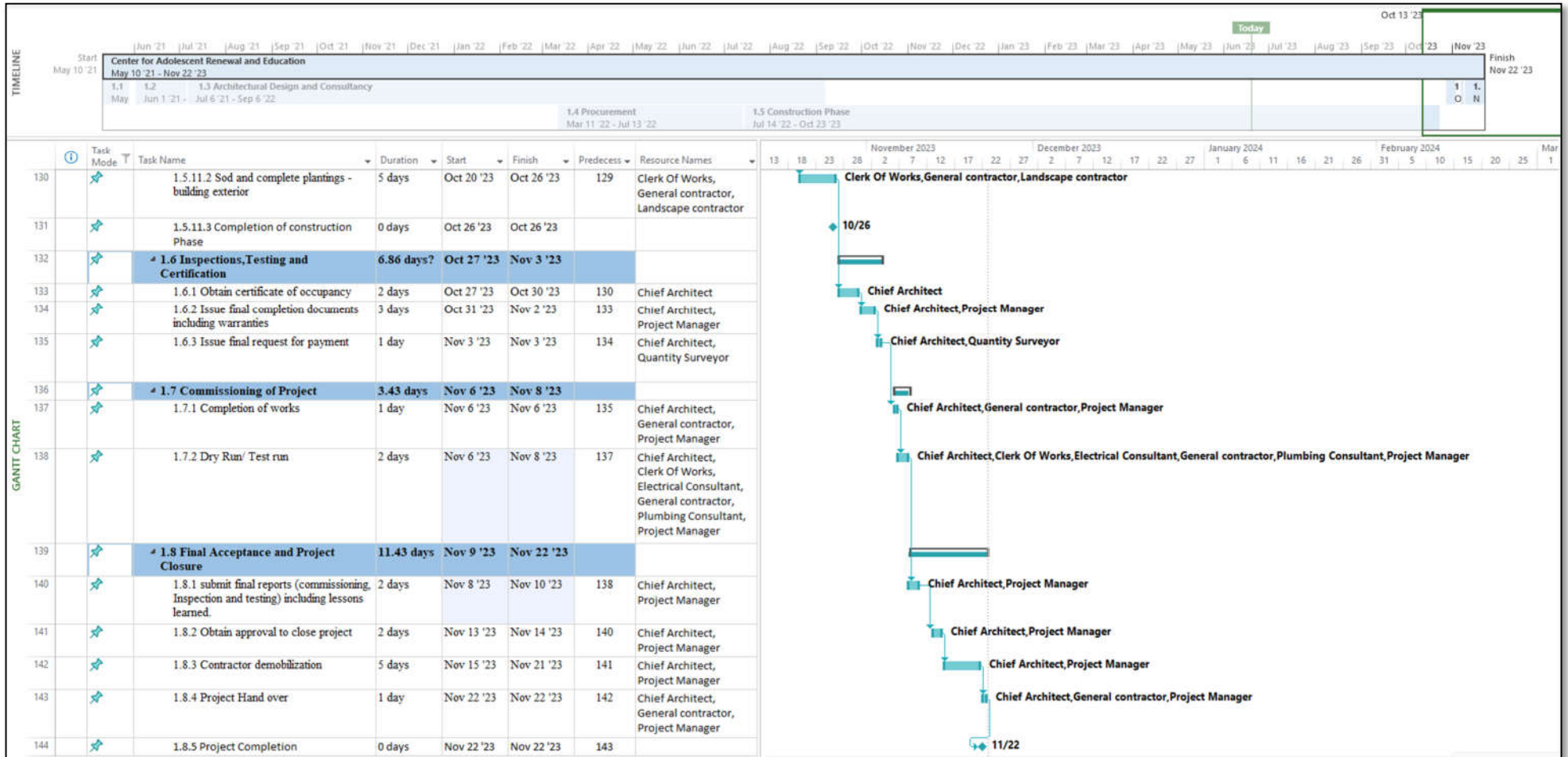
Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



Gantt Chart, Project Schedule – Continued (Information Source: Georges, L.B, Author, June 2023)



4.3.6 Control Schedule

According to PMBOK®Guide, 6th edition (2017), control schedule is the process of monitoring the status of the project to update the project schedule and manage changes to the schedule baseline.

The project manager, project management team and contractor will collaborate to ensure that the schedule is adhered to. Contractual terms and conditions oblige the contractor to complete all work within the scheduled time frame and the management team is duty bound to manage all work activities as indicated and agreed to in the project schedule.

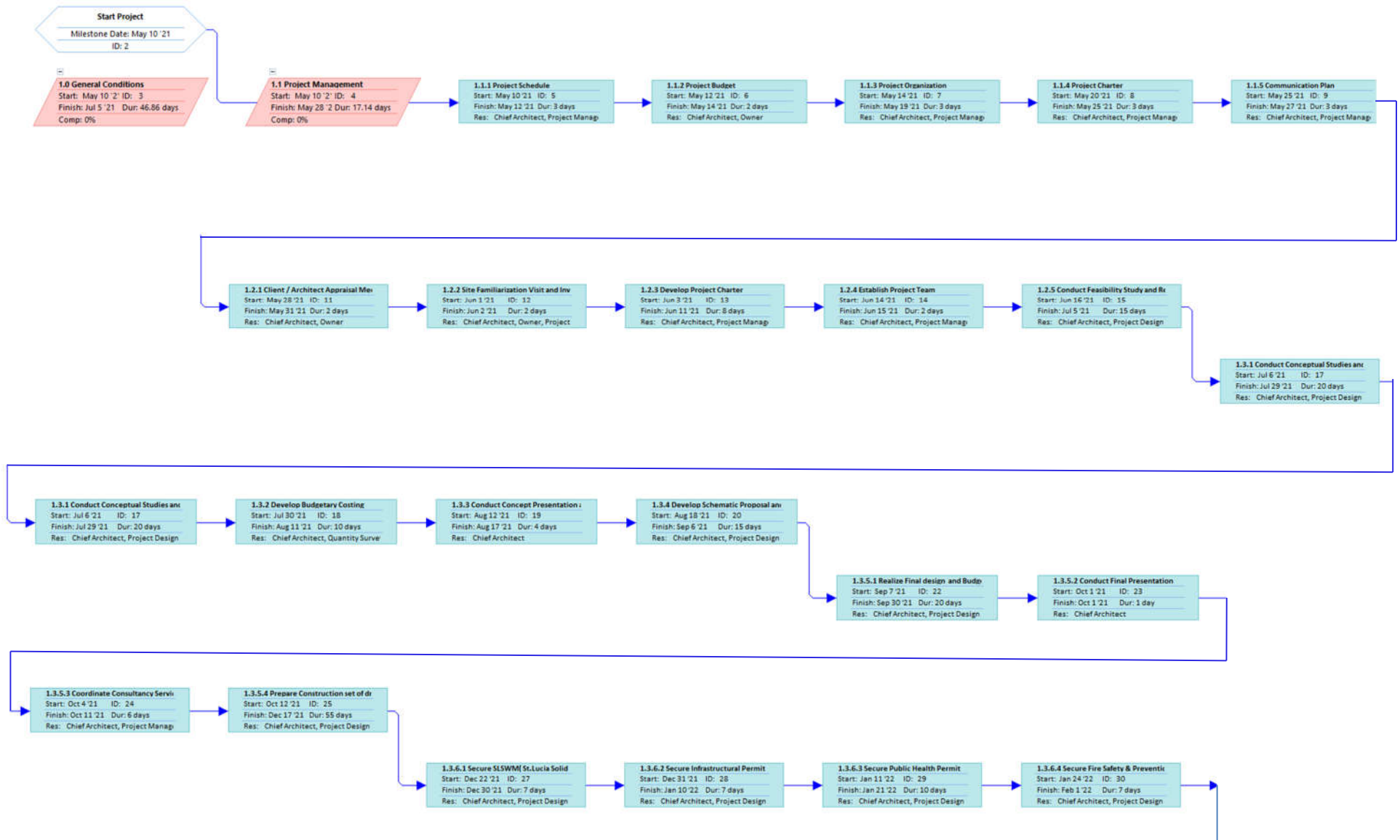
The project manager will be responsible for updating and monitoring work progress and percentage completion of main and sub activities at every stage in the project's development and throughout its life cycle. In the event of schedule changes, such will be logged through the integrated change control process (described in section 4.1.7) and through the use of the change request form. The project manager, the project sponsor, and the relevant subject matter experts will assess the change request to determine whether it merits approval or not. Once the change proposal is validated and approved, the project manager will ensure that the schedule is adjusted accordingly, and the change is recorded and communicated to relevant stakeholders.

The schedule control process involves bi-weekly design and construction site meetings for data collection, and project performance information is discussed and compared to planned and scheduled performance. Information acquired from the

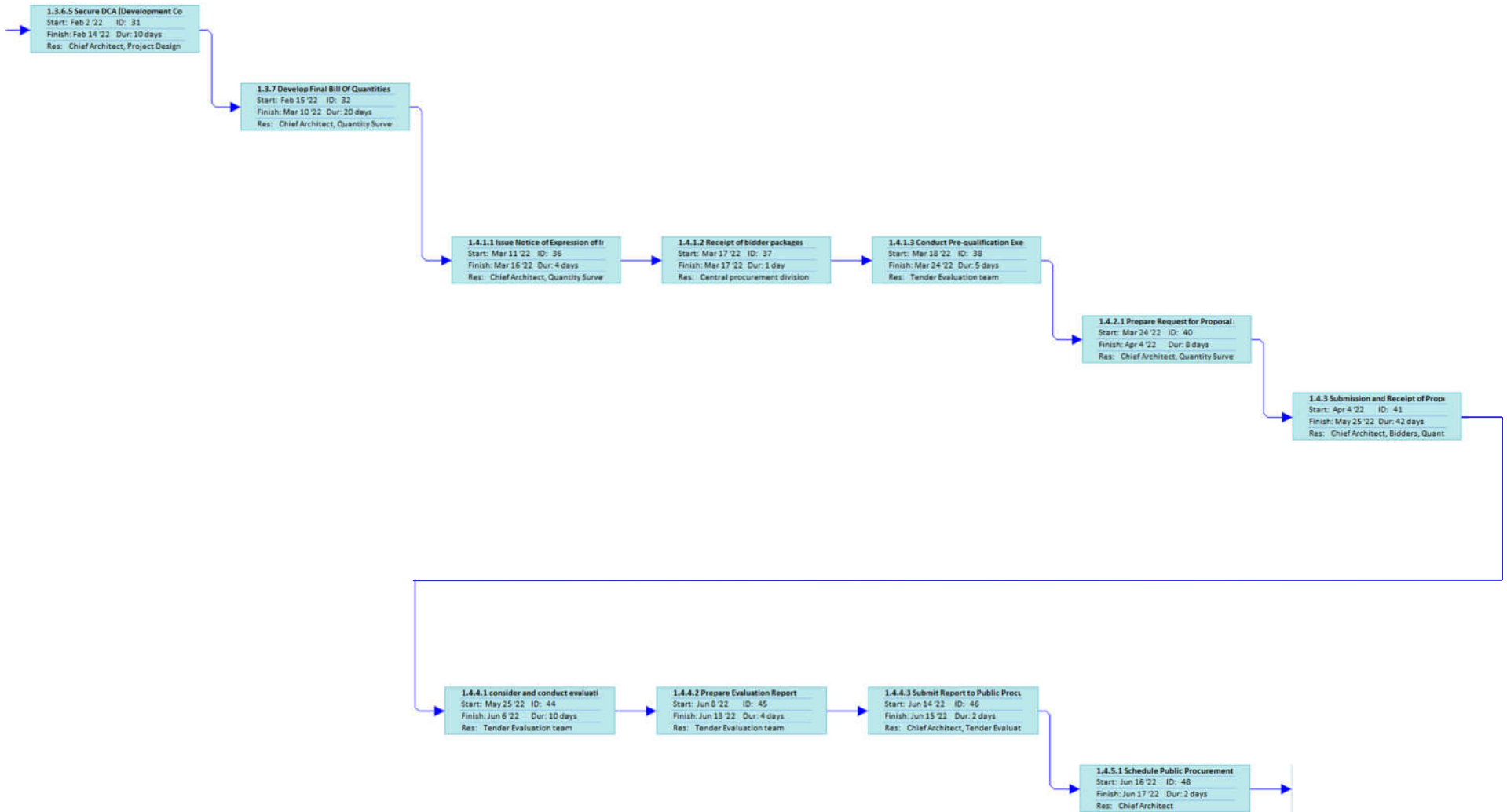
meetings is used to formulate progress reports on on-going work, expenditure, and forecasting future project development phases, based on current trends. All risks related to the schedule will be documented in the Risk Management Plan. They will be continuously scrutinized and regularly updated to avoid potential project delays.

A graphical representation of project activities and their interrelationships is depicted below in Chat No 19

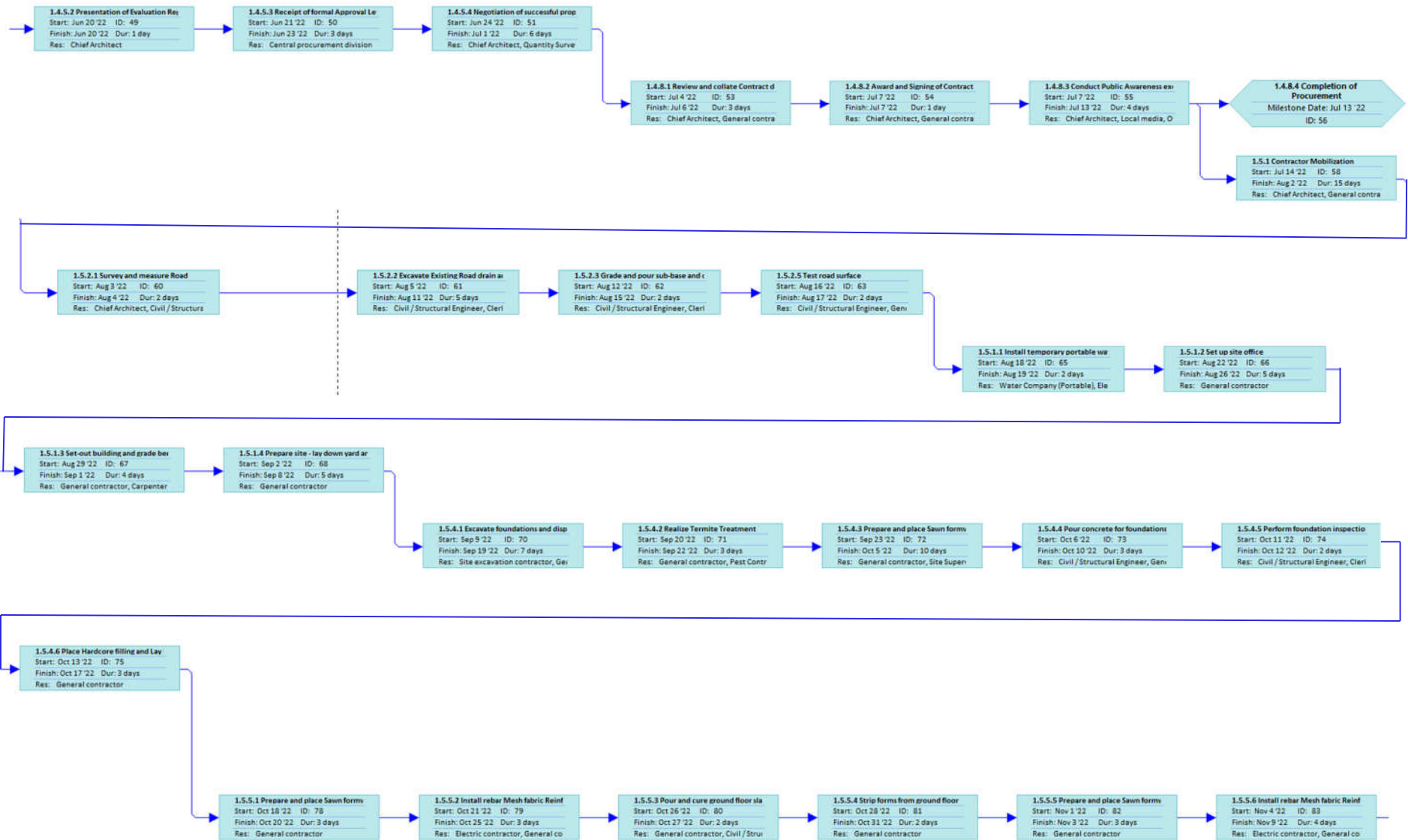
Part No. 19 Network Diagram (Source: Georges, L.B., Author, May 2023)



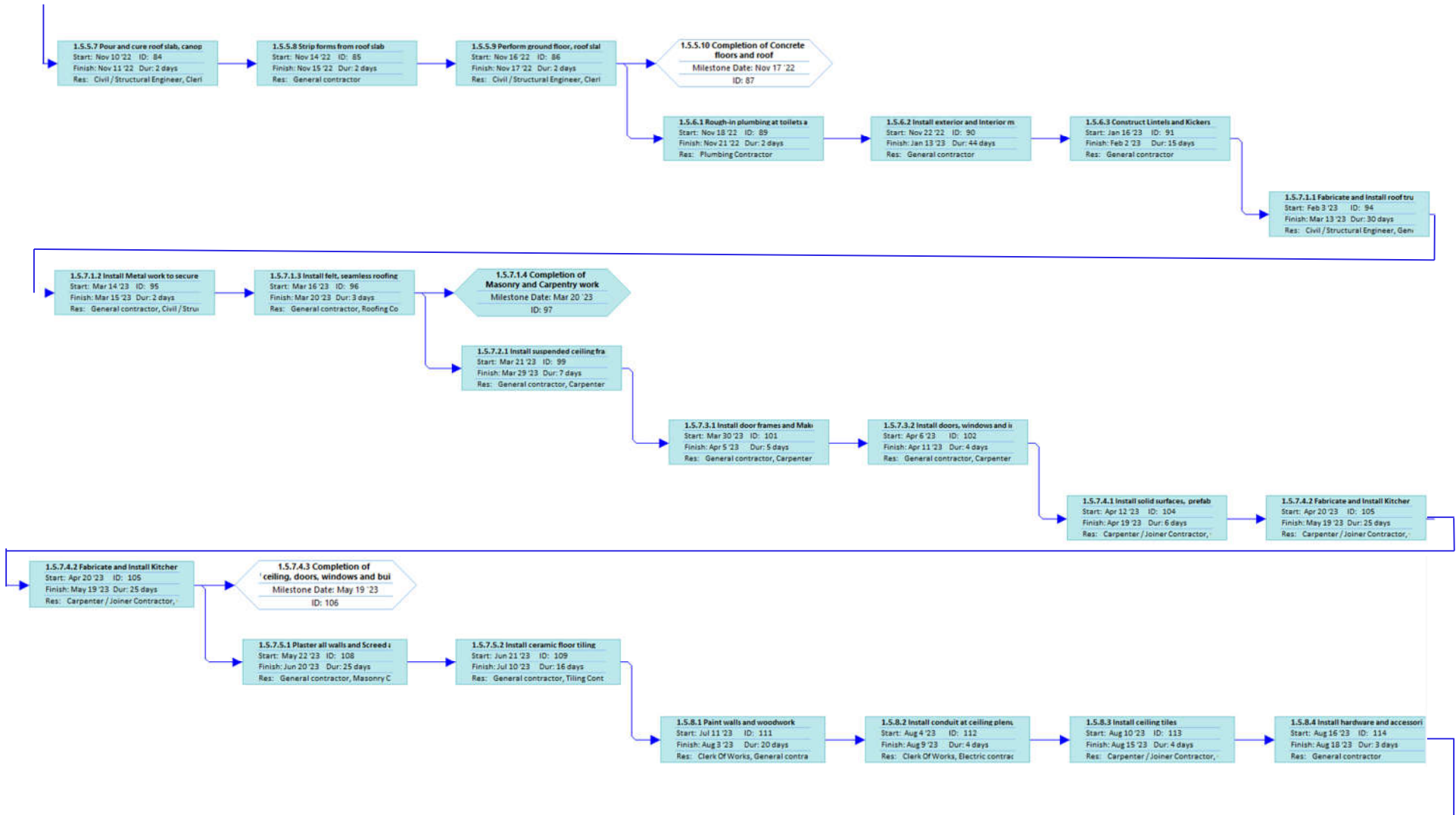
Network Diagram (Source: Georges, L.B., Author, May 2023)



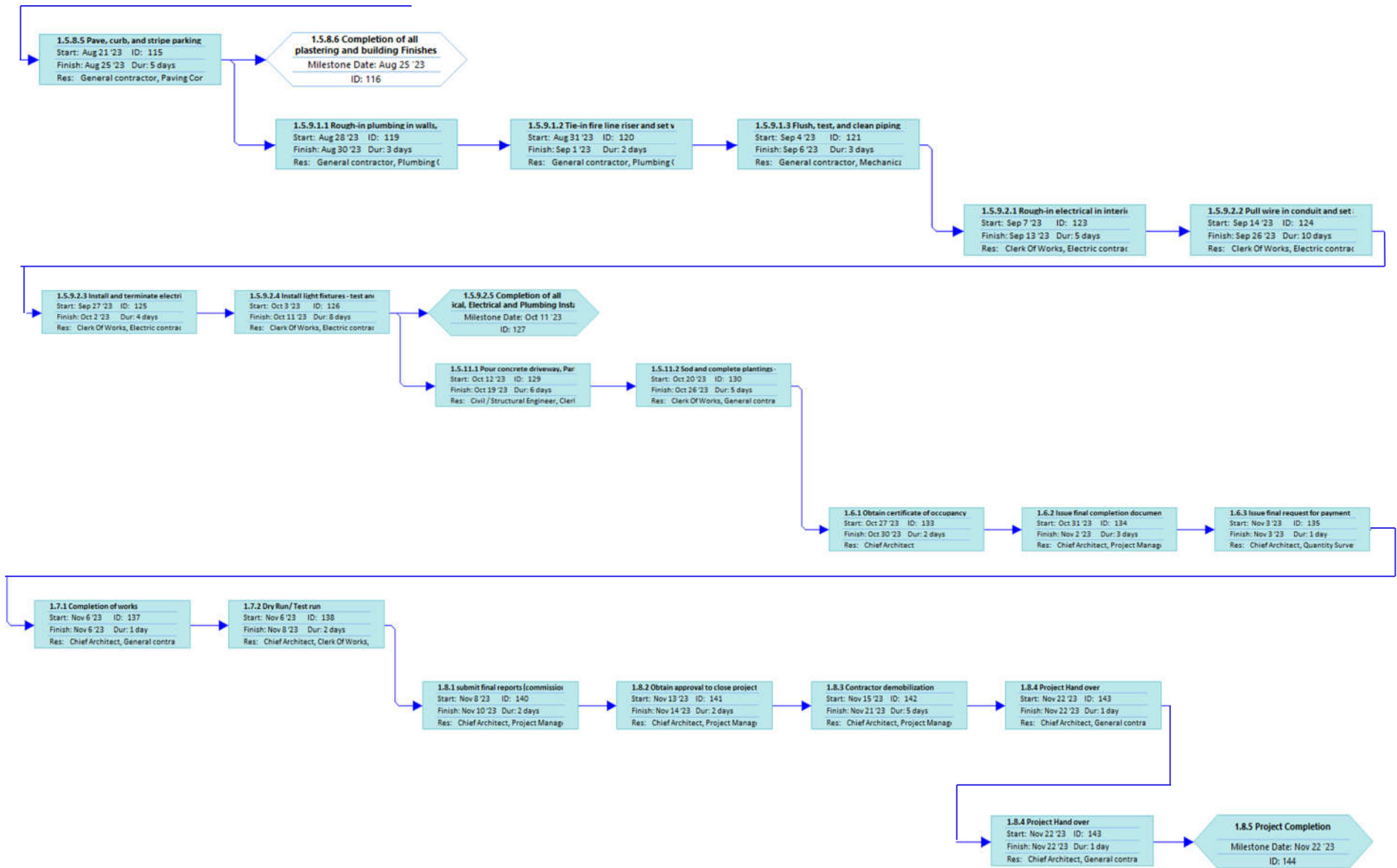
Network Diagram (Source: Georges, L.B., Author, May 2023)



Network Diagram (Source: Georges, L.B., Author, May 2023)



Network Diagram (Source: Georges, L.B., Author, May 2023)



4.3.7 Reserve analysis including justification.

Reserve analysis is carried out to determine the amount of contingency and management reserve needed for the project. Duration estimates may include contingency reserves (schedule reserves), to account for uncertainty within the schedule. Contingency reserves are the estimated duration within the schedule baseline. These are based on identified and accepted risks.

Management reserves of schedule management for the project, may also be accounted for, as reserves for a specified amount of the project budget, withheld for management control purposes, and are reserved for unforeseen work that is within scope of the project.

For this project, the Program Evaluation and Review Technique will be applied to all activities as a basis for project schedule reserves. This probabilistic approach will provide an estimated time period built into the schedule to accommodate unforeseen delays that can occur in the project's life cycle. This extra time will be a useful component to project planning.

Chat No 20 below depicts the deviation of Actual time against estimate to realize activities for the project.

Chart No. 20 Activity List and Variance calculated using PERT.

WBS Code	Activity Name	Predecessor	Optimistic duration (t0)	Most Likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variations (σ^2)
1	Start						
1.1.1	Project Schedule	NA	1	3	5	3.0	0.4
1.1.2	Project Budget	1.1.1	1	2	3	2.0	0.1
1.1.3	Project Organization	1.1.2	2	3	4	3.0	0.1
1.1.4	Project Charter	1.1.3	2	3	4	3.0	0.1
1.1.5	Communication Plan	1.1.4	2	3	4	3.0	0.1
1.2.1	Client / Architect Appraisal Meeting.	1.1.5	1	2	4	2.2	0.3
1.2.2	Site Familiarization Visit and Investigation	1.2.1	1	2	3	2.0	0.1
1.2.3	Develop Project Charter	1.2.2	6	8	10	8.0	0.4
1.2.4	Establish Project Team	1.2.3	1	2	3	2.0	0.1
1.2.5	Conduct Feasibility Study and Report	1.2.4	14	15	16	15.0	0.1
1.3.1	Conduct Conceptual Studies and prepare Design Solutions	1.2.5	15	20	25	20.0	2.8
1.3.2	Develop Budgetary Costing	1.3.1	8	10	12	10.0	0.4
1.3.3	Conduct Concept Presentation and Obtain Stakeholder Feedback, including change request	1.3.2	2	4	6	4.0	0.4

WBS Code	Activity Name	Predecessor	Optimistic duration (t0)	Most Likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variances (σ^2)
1.3.4	Develop Schematic Proposal and Conduct presentation No. 02	1.3.3	10	15	20	15.0	2.8
1.3.5.1	Realize final design and budgetary costing adjustments/modifications	1.3.4	16	20	26	20.3	2.8
1.3.5.2	Conduct Final Presentation	1.3.5.1	1	1	1	1.0	0.0
1.3.5.3	Coordinate Consultancy Services	1.3.5.2	4	6	10	6.3	1.0
1.3.5.4	Prepare Construction set of drawings	1.3.5.3	50	55	60	55.0	2.8
1.3.6.1,1.3.6.2,1.3.6.3,1.3.6.4,1.3.6.5	Secure Permits (Solid Waste Management, Infrastructural, Public Health, Fire Safety & Prevention, Development Control Authority)	1.3.5.4	30	31	34	31.3	0.4
1.3.7	Develop final Bill of Quantities	1.3.6.1,1.3.6.2,1.3.6.3,1.3.6.4,1.3.6.5	15	20	25	20.0	2.8
1.4.1.1	Issue Notice of Expression of Interest	1.3.7	3	4	5	4.0	0.1
1.4.1.2	Receipt of bidder packages	1.4.1.1	1	1	1	1.0	0.0
1.4.1.3	Conduct Pre-qualification Exercises	1.4.1.2	4	5	7	5.2	0.3
1.4.2.1	Prepare Request for Proposal and Collate supporting documents	1.4.1.3	6	8	10	8.0	0.4

WBS Code	Activity Name	Predecessor	Optimistic duration (t0)	Most Likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variances (σ^2)
1.4.3	Submission and Receipt of Proposal		30	42	45	40.5	6.3
1.4.3.1	Conduct Opening of Tenders Meeting	1.4.2.1	1	1	1	1.0	0.0
1.4.4.1	Consider and conduct evaluation of financial proposals and select successful proposal	1.4.3.1	8	10	12	10.0	0.4
1.4.4.2	1.4.4.2 Prepare Evaluation Report	1.1.4.1	2	4	6	4.0	0.4
1.4.4.3	1.4.4.3 Submit Report to Public Procurement Board	1.4.4.2	1	2	3	2.0	0.1
1.4.5.1	Schedule Public Procurement Board Meeting	1.4.4.3	1	2	3	2.0	0.1
1.4.5.2	Presentation of Evaluation Report	1.4.5.1	1	1	1	1.0	0.0
1.4.5.3	Receipt of formal Approval Letter	1.4.5.2	2	3	4	3.0	0.1
1.4.5.4	Negotiation of successful proposal	1.4.5.3	5	6	8	6.2	0.3
1.4.8.1	Review and collate contract documents	1.4.5.4	2	3	4	3.0	0.1
1.4.8.2	Award and signing of contract	1.4.8.1	1	1	1	1.0	0.0
1.4.8.3	Conduct public awareness exercise	1.4.8.2	3	4	5	4.0	0.1
1.5.1	Contractor mobilization	1.4.8.3	14	15	16	15.0	0.1
1.5.2.1	Survey and measure road	1.5.1	1	2	3	2.0	0.1
1.5.2.2	Excavate existing road drain and secure precast concrete culverts.	1.5.2.1	3	5	7	5.0	0.4

WBS Code	Activity Name	Predecessor	Optimistic duration (t0)	Most Likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variances (σ^2)
1.5.2.3	Grade and pour sub-base and compact.	1.5.2.2	1	2	3	2.0	0.1
1.5.2.5	Test road surface	1.5.2.3	1	2	3	2.0	0.1
1.5.1.1	Install temporary potable water and electricity.	1.5.2.5	1	2	3	2.0	0.1
1.5.1.2	Set up site office	1.5.1.1	4	5	6	5.0	0.1
1.5.1.3	Set out building and grade benchmarks	1.5.1.2	3	4	5	4.0	0.1
1.5.1.4	Prepare site - lay down yard and temporary fencing	1.5.1.3	4	5	6	5.0	0.1
1.5.4.1	Excavate foundations and dispose of excavated material	1.5.1.4	5	7	9	7.0	0.4
1.5.4.2	Realize termite treatment	1.5.4.1	2	3	4	3.0	0.1
1.5.4.3	Prepare and place sawn formwork and install rebar for in-ground beams and strip footings	1.5.4.2	8	10	12	10.0	0.4
1.5.4.4	Pour concrete for foundations and ground beams	1.5.4.3	2	3	4	3.0	0.1
1.5.4.5	Perform foundation inspection	1.5.4.4	1	2	3	2.0	0.1
1.5.4.6	Place hardcore filling and ay damp-proof membrane	1.5.4.5	2	3	5	3.2	0.3
1.5.5.1	Prepare and place sawn formwork to sides of ground beams and strip footing.	1.5.4.6	2	3	4	3.0	0.1

WBS Code	Activity Name	Predecessor	Optimistic duration (t0)	Most Likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variances (σ^2)
1.5.5.2	Install rebar mesh fabric reinforcement, and in-floor utilities (including mechanical, electrical, plumbing) for ground floor slab	1.5.5.1	2	3	4	3.0	0.1
1.5.5.3	Pour and cure ground floor slab	1.5.5.2	1	2	3	2.0	0.1
1.5.5.4	Strip forms from ground floor	1.5.5.3	1	2	3	2.0	0.1
1.5.5.5	Prepare and place sawn formwork to sides of roof slab including all canopies and parapets	1.5.5.4	2	3	4	3.0	0.1
1.5.5.6	Install rebar mesh fabric reinforcement, and in-slab utilities (including mechanical, electrical, plumbing) for roof slab	1.5.5.5	3	4	5	4.0	0.1
1.5.5.7	Pour and cure roof slab, canopies, and parapets.	1.5.5.6	1	2	3	2.0	0.1
1.5.5.8	Strip forms from roof slab.	1.5.5.7	1	2	3	2.0	0.1
1.5.5.9	Perform ground floor, roof slab, canopies, and parapets inspection	1.5.5.8	1	2	3	2.0	0.1
1.5.6.1	Rough-in plumbing at toilets and masonry walls	1.5.5.9	1	2	3	2.0	0.1

WBS Code	Activity Name	Predecessor	Optimistic duration (t0)	Most Likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variances (σ^2)
1.5.6.2	Install exterior and interior masonry work	1.5.6.1	37	45	48	44.2	3.4
1.5.6.3	Construct lintels and kickers	1.5.6.2	10	15	20	15.0	2.8
1.5.7.1.1	Fabricate and install roof trusses and roof framing over main roof and walkways	1.5.6.3	28	30	32	30.0	0.4
1.5.7.1.2	Install metal work to secure roof trusses and rafters, and pour lightweight concrete roof fill	1.5.7.1.1	1	2	3	2.0	0.1
1.5.7.1.3	Install felt seamless roofing material, flashing and metal guttering	1.5.7.1.2	2	3	4	3.0	0.1
1.5.7.2.1	Install suspended ceiling framing.	1.5.7.1.3	5	7	9	7.0	0.4
1.5.7.3.1	Install door frames and make good all window openings	1.5.7.2.1	4	5	6	5.0	0.1
1.5.7.3.2	Install doors, windows, and ironmongery hardware	1.5.7.3.1	3	4	5	4.0	0.1
1.5.7.4.1	Install solid surfaces, prefabricated bathroom partitions and vanities	1.5.7.3.2	4	6	8	6.0	0.4
1.5.7.4.2	Fabricate and install kitchen cabinets storage cupboards and open shelving	1.5.7.4.1	23	25	27	25.0	0.4

WBS Code	Activity Name	Predecessor	Optimistic duration (t0)	Most Likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variances (σ^2)
1.5.7.5.1	Plaster all walls and screed all internal floors	1.5.7.4.2	20	25	30	25.0	2.8
1.5.7.5.2	Install ceramic floor tiling	1.5.7.5.1	14	16	18	16.0	0.4
1.5.8.1	Paint walls and woodwork	1.5.7.5.2	16	20	24	20.0	1.8
1.5.8.2	Install conduit at ceiling plenum space.	1.5.8.1	3	4	5	4.0	0.1
1.5.8.3	Install ceiling tiles	1.5.8.2	2	4	6	4.0	0.4
1.5.8.4	Install hardware and accessories	1.5.8.3	2	3	4	3.0	0.1
1.5.8.5	Pave, curb, and strip parking lot	1.5.8.4	3	5	7	5.0	0.4
1.5.9.1.1	Rough-in plumbing in walls, Set plumbing fixtures and trim	1.5.8.5	2	3	4	3.0	0.1
1.5.9.1.2	Tie-in fire line riser and set valves	1.5.9.1.1	1	2	3	2.0	0.1
1.5.9.1.3	Flush test, and clean piping and fixtures	1.5.9.1.2	2	3	4	3.0	0.1
1.5.9.2.1	Rough-in electrical in interior and exterior walls	1.5.9.1.3	3	5	7	5.0	0.4
1.5.9.2.2	Pull wire in conduit and set area transformers	1.5.9.2.1	8	10	12	10.0	0.4
1.5.9.2.3	Install and terminate electrical devices	1.5.9.2.2	3	4	5	4.0	0.1
1.5.9.2.4	Install light fixtures - test and clean	1.5.9.2.3	6	8	10	8.0	0.4

WBS Code	Activity Name	Predecessor	Optimistic duration (t0)	Most Likely Duration (tM)	Pessimistic Duration (tP)	Expected Duration (tE)	Variances (σ^2)
1.5.11.1	Pour concrete on driveway, parking lot and sidewalks	1.5.9.2.4	4	6	8	6.0	0.4
1.5.11.3	Sod and complete plantings - building exterior	1.5.11.1	3	5	7	5.0	0.4
1.6.1	Obtain certificate of occupancy	1.5.11.3	1	2	3	2.0	0.1
1.6.2	Issue final completion documents including warranties	1.6.1	2	3	4	3.0	0.1
1.6.3	Issue final request for payment	1.6.2	2	1	4	1.7	0.1
1.7.7	Completion of works	1.6.3	1	1	1	1.0	0.0
1.7.2	Dry Run/ Test run	1.7.7	1	2	3	2.0	0.1
1.8.1	Submit final report including lessons learned	1.7.2	1	2	3	2.0	0.1
1.8.2	Obtain approval to close project	1.8.1	1	2	3	2.0	0.1
1.8.3	Contractor demobilization	1.8.2	4	5	6	5.0	0.1
1.8.4	Project Hand over	1.8.3	1	1	1	1.0	0.0
1.8.5	Project Completion					0.0	0.0
	Total Project Duration			701		701.0	48.7

Total Expected duration (tE) = 701 days


Total Variance = 48.7

Standard Deviation = 6.98

Project duration with 84% probability = 707.98 days (701+6.98)

4.3.1 Schedule Management Plan Approval

The signatures of the people below indicate an understanding of the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.4 PROJECT COST MANAGEMENT

Cost Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

According to PMBOK®Guide 6th edition (2017) the Project Cost Management processes are defined as:

- Plan Cost Management
- Estimate Cost
- Determine Budget
- Control Cost

4.4.1 Introduction

A Cost Management Plan is designed to aid project managers in accurately determining the combined costs and financial resources required to produce the project deliverables. In an effort to control overall spending, the cost management plan allows for unit expenses to be estimated and managed based on pre-arranged work packages/ tasks/ activities. This plan is vital in the financial management of the project, as it records direct and indirect project costs in one document to decrease the possibility of exceeding the project budget.

4.4.2 Plan Cost Management

Plan cost management process for the design and construction of the Center for Adolescent Renewal and Education will establish the cost of all resources needed to successfully complete the project. The plan will be aligned to the recommendations of PMBOK® 6th edition (2017) to plan, manage, budget and control project costs. Overall project details will be discussed with stakeholders, considering boundaries, assumptions, constraints, and risks, whose input will positively impact the project budget.

Project deliverables will be broken down into work packages and major milestones. Each activity under a work package will be listed with its estimated unit cost and tallied to establish an initial cost baseline. Contingency reserves will be calculated as a percentage (10%) of the deliverables relating to the design and construction of the Center for Adolescent Renewal and Education.

The initial cost baseline and contingency reserves will be summed to establish an overall project budget where labour, capital, material, and resources will be assigned to each activity to derive the corresponding activity costs, for discussion and review by project manager and sponsor before final approval. Any unplanned costs arising due to change requests or unforeseen circumstances during project execution will be reported and follow the integrated change control process. Priority will be given to costs having an immediate impact on on-going works and will consequently trigger an emergency meeting to obtain approval for the cost change. Cost changes within the contingency amount will be approved and justified accordingly while any

financial exceeding the available contingency amount will require approval and funding from the Central Procurement Unit of the Department of Finance. Information will be communicated to all relevant stakeholders in a timely manner and progress updates will follow via established communication systems.

4.4.3 Estimate Cost

The estimate cost process for the design and construction of the Center for Adolescent Renewal and Education will generate an approximate cost of monetary resources required for the completion of project activities. This process will be realized in collaboration with the quantity surveyor and through constant consultation with the project architect, engineers, and consultants. The project manager and chief architect will oversee the process and ensure that the scope of the project is reflective of the project requirements for estimating costs and determining final project budget.

The estimation technique selected to estimate the project cost will be a combination of analogous and top-down estimation. This hybrid approach will allow for the gleanings of insights from similar construction-type projects and abide by its fixed budget. The total budget for this project is US\$871,314.00 (approximately \$2,367,273.00 XCD), and as such, is the maximum amount that can be spent on expenses. The wider budget will be split into the various tasks/ activities, as well as the assigned resources. The main advantages of using this blended approach will be

to: (1) learn from financial mistakes of past projects and (2) have a clear understanding of the impact that work packages have on the fixed budget.

4.4.4 Basis for cost estimates

Costs will be determined through a combination of analogous methods and expert knowledge. This is required due to the nature of the project. Within construction there are various components which are based on unit rate cost. The use of this information from past projects becomes vital for cost estimation.

4.4.5 Activity Cost Estimates

Activity cost estimates is the practice of estimating monetary resources required to carry out activities and project work. The main objective is to determine the value of monetary resources needed for the project.

The activity cost estimate list for the design and construction of the Center for Adolescent Renewal and Education is depicted below in Chat No 21

Chart No. 21 Activity Cost estimates List e.g. (Source: Georges, L.B., Author, June 2023)

ACTIVITY COST ESTIMATE LIST										
Project Number	2031		Project Name				Project Manager			
			Design and Construction of the Center for Adolescent Renewal and Education				Lyndon B Georges			
WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.2.1	12	Client / Architect Appraisal Meeting.	Receive clients' instructions and statements of requirements to formulate and advise client on a strategic course of action.	Chief Architect, Owner/ Client	2	7	Hr	\$75.00	14	\$1,050.00
1.2.2	14	Site Familiarization, Visit and Investigation	Visit the proposed site to gather information and obtain visual characteristics of its immediate urban environment.	Chief Architect, Owner, Project manager.	2	7	Hr	\$150.00	14	\$2,100.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.2.3	16	Develop Project Charter	Develop a formal document that lays out the project vision, scope, objectives, project team and their responsibilities etc.	Chief Architect, Project Manager	8	7	Hr	\$75.00	56	\$4,200.00
1.2.4	18	Establish Project Team	Compile the group of individuals who will be engaged in the design and implementation of the project.	Chief Architect, Project Manager	2	7	Hr	\$75.00	14	\$1,050.00
1.2.5	20	Conduct Feasibility Study and Report	Assess the site and its urban environment to determine the practicality of the proposed project, taking into consideration all pros and cons associated with the same and generate a final report.	Chief Architect, Project Design Team	15	7	Hr	\$150.00	105	\$15,750.00
1.3.1	22	Conduct Conceptual Studies and prepare Design Solutions	Develop project brief and explore studies illustrating spatial relationship, massing, and circulation and services systems.	Chief Architect, Project Design Team	20	7	Hr	\$75.00	140	\$10,500.00
1.3.2	24	Develop Budgetary Costing	Prepare in collaboration with quantity surveyor a statement of probable cost of construction based on the conceptual design.	Chief Architect, Quantity Surveyor	10	7	Hr	\$75.00	70	\$5,250.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.3.3	26	Conduct Concept Presentation and Obtain Stakeholder Feedback, including change request	Conduct presentation using graphical representation of the design and receive and receive feedback from key stakeholders for possible design alterations etc.	Chief Architect	4	7	Hr	\$65.00	28	\$1,820.00
1.3.4	28	Develop schematic proposal and conduct presentation No. 02	Conduct design modification as per change requests through outlined proposal and present to project stakeholders.	Chief Architect, Project Design Team	15	7	Hr	\$65.00	105	\$6,825.00
1.3.5.1	30	Realize final design and budgetary costing adjustments/modifications	Final outlined project proposal describing size and character of entire project to include architectural, engineering systems, materials, building placement on site etc.	Chief Architect, Project Design Team, Quantity Surveyor	20	7	Hr	\$75.00	140	\$10,500.00
1.3.5.2	32	Conduct final presentation	Graphical presentation of the finalized project.	Chief Architect	1	7	Hr	\$45.00	7	\$315.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.3.5.3	34	Coordinate consultancy services	Contract consultants and collaborate to prepare full coordinated set of architectural and engineering drawings, schedules, and specifications for tender processes.	Chief Architect, Project Management Team	6	7	Hr	\$240.00	42	\$10,080.00
1.3.5.4	36	Prepare construction set of drawings	The design team prepares and collates the set of drawings to guide the building construction and for use to obtain building permits.	Chief Architect, Project Design Team	55	7	Hr	\$150.00	385	\$57,750.00
1.3.6.1, 1.3.6.2, 1.3.6.3, 1.3.6.4, 1.3.6.5, 1.3.6.6	038-046	Secure Permits (Solid Waste Management, Infrastructural, Public Health, Fire Safety & Prevention, Development Control Authority)	Make submission of documents and construction drawing to statutory bodies for approval and building permits.	Chief Architect, Project Design Team	41	7	Hr	\$68.00	287	\$19,516.00
1.3.7	48	Develop final bill of quantities	Prepare a statement of cost of construction using the construction set of drawings and specifications.	Chief Architect, Quantity Surveyor	20	7	Hr	\$22.50	140	\$3,150.00
1.3.8	50	Completion of architectural design and receipt of permits	Milestone	Project Design Team	0	0	0	\$0.00	0	\$0.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.4.1.1	52	Issue notice of expression of interest	Advertise in the National gazette a notice of expression of interest to tender on the construction of the project.	Chief Architect, Quantity Surveyor	4	7	Lumpsum	\$300.00	1	\$300.00
1.4.1.2	54	Receipt bidder packages	Receive sealed packages from interested bidders with requisite information as per 1.4.1.1.	Central Procurement Division	1	7	Lumpsum	\$300.00	1	\$300.00
1.4.1.3	56	Conduct pre-qualification exercises	Evaluation team to open individual bids and assess validity of information provided against the requirements of the Procurement and Stores Act for this intervention.	Tender Evaluation Team	5	7	Hr	\$75.00	35	\$2,625.00
1.4.2.1	58	Prepare request for proposal and collate supporting documents	Collate tender documents, and construction drawings to enable tenders to be placed and provide information for preparation of pre-tender cost estimates.	Chief Architect, Quantity Surveyor	8	7	Hr	\$75.00	56	\$4,200.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.4.3	60	Submission and Receipt of Proposal	Submit tender packages to bidders and receive completed packages on the stipulated date and time.	Chief Architect Bidders, Quantity Surveyor	42	7	Hr	\$12.50	294	\$3,675.00
1.4.4.1	62	Consider and conduct evaluation of financial proposals and select successful proposal	Evaluation team evaluates bid submissions and selects a qualifying bidder.	Tender Evaluation Team	10	7	Hr	\$150.00	70	\$10,500.00
1.4.4.2	64	Prepare evaluation report	Prepare a detailed statement on the evaluation methodology used and the justification for the winning bidder.	Tender Evaluation Team	4	7	Hr	\$240.00	28	\$6,720.00
1.4.4.3	66	Submit report to Public Procurement Board	Submit evaluation report and all supporting appendices.	Chief Architect, Tender Evaluation Team	2	7	Hr	\$35.00	14	\$490.00
1.4.5.1	68	Schedule Public Procurement Board meeting	Schedule meeting to discuss evaluation report and winning bidder.	Chief Architect	2	7	Lumpsum	\$300.00	1	\$300.00
1.4.5.2	70	Presentation of evaluation report	Present report to procurement board.	Chief Architect	1	7	Lumpsum	\$300.00	1	\$300.00
1.4.5.3	72	Receipt of formal approval letter	Receive approval letter to proceed to negotiations and contracting from Central Procurement Unit.	Central Procurement division	3	7	Lumpsum	\$300.00	1	\$300.00
1.4.5.4	74	Negotiation of successful proposal	Negotiate a reduced construction cost with winning bidder.	Chief Architect, Quantity Surveyor	6	7	Lumpsum	\$500.00	1	\$500.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.4.8.1	76	Review and collate contract documents	Vet and collate construction contract.	Chief Architect, General Contractor, Legal Officer, Quantity Surveyor	3	7	Hr	\$150.00	21	\$3,150.00
1.4.8.2	78	Award and signing of contract	Award and signing of contract by relevant parties.	Chief Architect, General Contractor, Quantity Surveyor	1	1	Lumpsum	\$300.00	1	\$300.00
1.4.8.3	80	Conduct public awareness exercise	Conduct townhall and constituency meeting as well as media broadcasts to engage and inform the public and neighboring communities of the proposed project intervention.	Chief Architect, Owner, Local Media	4	7	Hr	\$450.00	28	\$12,600.00
1.4.8.4	82	Completion of procurement	Milestone	Chief Architect, General Contractor, Legal Officer, Quantity Surveyor	0	0	0	\$0.00	0	\$0.00
1.5.1	84	Contractor mobilization	Allowing a time period before commencement of construction activities for contractor to mobilize all material, plant, and equipment.	Chief Architect, General Contractor, Project Manager	15	7	Lumpsum	\$25,000.00	1	\$25,000.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.2.1	86	Survey and measure road	Surveyor establishes reference parameters for road.	Chief Architect, Civil/Structural Engineer, General Contractor	2	7	hr	\$250.00	14	\$3,500.00
1.5.2.2	88	Excavate existing road drain and secure precast concrete culverts.	Remove topsoil and silt and debris from drain to solid base and place reenforce concrete culverts.	Civil/Structural Engineer, Clerk of Works, Project Manager, Site excavation contractor, Site supervisor.	5	7	Hr	\$60.00	35	\$2,100.00
1.5.2.3	90	Pour and Grade sub-base and compact.	Pour sub-base material and grade to obtain a level road surface and compact as per engineering specifications.	Civil/Structural Engineer, Clerk of Works, General Contractor, Project Manager.	2	7	Hr	\$60.00	14	\$840.00
1.5.2.5	92	Test Road surface	Conduct vehicular traffic test over newly built road to assure it meets required standards.	Civil/Structural Engineer, General Contractor, Project Manager, Project Architect.	2	7	Lumpsum	\$3,000.00	1	\$3,000.00
1.5.1.1	94	Install temporary potable water and electricity.	Electrical and water service providers conduct installation of temporary services for construction phase.	Water Company, Electric Company	2	7	Lumpsum	\$2,500.00	1	\$2,500.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.1.2	96	Set up site office	Build or transport in place site office for managing construction activities.	General Contractor	5	7	Lumpsum	\$5,000.00	1	\$5,000.00
1.5.1.3	98	Set out building and grade benchmarks	Survey and place batter boards to establish reference points for building placement and commence ground grading as necessary.	General Contractor	4	7	HR	\$500.00	28	\$14,000.00
1.5.1.4	100	Prepare site - lay down yard and temporary fencing	Establish building plant, equipment, and traffic circulation zones on site and construct protective fencing with placement of all required signage.	General Contractor	5	7	HR	\$500.00	35	\$17,500.00
1.5.4.1	102	Excavate foundations and dispose of excavated material	Excavation of all building foundation zones to require depth and dispose of excavated material in waterlogged zone on site.	Site Excavation Contractor, General Contractor	7	7	Hr	\$435.21	49	\$21,325.29
1.5.4.2	104	Realize termite treatment	Treatment of ground for termites.	General Contractor, Pest Control specialist	3	7	Hr	\$170.00	21	\$3,570.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.4.3	106	Prepare and place sawn formwork and install rebar for in-ground beams and strip footings	Measure, prepare and place formwork to receive structural reinforcement for casting ground beams as per engineering specifications.	General Contractor, Site Supervisor	10	7	Hr	\$1,112.00	70	\$77,840.00
1.5.4.4	108	Pour concrete for foundations and ground beams	Concrete is transported to site and poured in place for foundations and ground beams	Civil/Structural Engineer, General Contractor.	3	7	Hr	\$2,224.75	21	\$46,719.75
1.5.4.5	110	Perform foundation inspection	Conduct rebound hammer test or similar inspections on cured concrete foundations to assure they meet required standards.	Civil/Structural Engineer, Clerk of works, Project Manager.	2	7	Hr	\$70.00	14	\$980.00
1.5.4.6	112	Place hardcore filling and lay damp proof membrane	Transport to site and dump and place specified hardcore material within enclosed foundation zone, compacting as specified and finishing with placement of the damp proof membrane.	General Contractor	3	7	Hr	\$1,500.00	21	\$31,500.00
1.5.4.7	114	Completion of foundations	Milestone	General Contractor	0	0	0	\$0.00	0	\$0.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.5.1	116	Prepare and place sawn formwork to sides of ground beams and strip footing.	Secure formwork to construct ground beams and reference height of structural floor around entire building enclosure.	General Contractor	3	7	Hr	\$175.00	21	\$3,675.00
1.5.5.2	118	Install rebar mesh fabric reinforcement, and in-floor utilities (including mechanical, electrical, plumbing) for ground floor slab	Installs all structural reinforcement as per engineering specification and all mechanical, electrical, and plumbing infrastructure.	Electric contractor, General contractor, Plumbing Contractor	3	7	Hr	\$750.00	21	\$15,750.00
1.5.5.3	120	Pour and cure ground floor slab	Transport concrete and pour in place as per specifications and allow to cure for specified time period.	General contractor, Civil / Structural Engineer, Clerk of Works, Site Supervisor	2	7	Hr	\$871.00	14	\$12,194.00
1.5.5.4	122	Strip forms from ground floor	Remove all formwork when concrete has cured.	General Contractor	2	7	Hr	\$80.00	14	\$1,120.00
1.5.5.5	124	Prepare and place sawn formwork to sides of roof slab including all canopies and parapets	Secure and strut formwork to constructed ream beams or blockwork and reference height of structural roof slab, canopies, and parapets.	General Contractor	3	7	Hr	\$2,935.00	21	\$61,635.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.5.6	126	Install rebar mesh fabric reinforcement, and in-slab utilities (including mechanical, electrical, plumbing) for roof slab	Installs all structural reinforcement as per engineering specification and all mechanical, electrical, and plumbing infrastructure.	Electric contractor, General contractor, Plumbing Contractor	4	7	Hr	\$3,018.00	28	\$84,504.00
1.5.5.7	128	Pour and cure roof slab, canopies, and parapets.	Transport concrete and pour in place as per specifications and allow to cure for specified time period.	Civil / Structural Engineer, Clerk of Works, General contractor	2	7	Hr	\$5,895.00	14	\$82,530.00
1.5.5.8	130	Strip forms from roof slab.	Remove all formwork when concrete has cured.	General Contractor	2	7	Hr	\$80.00	14	\$1,120.00
1.5.5.9	132	Perform ground floor, roof slab, canopies, and parapets inspection	Conduct rebound hammer test or similar inspections on cured concrete.	Civil / Structural Engineer, Clerk of Works, Electrical Consultant, Mechanical Consultant, Plumbing Consultant, Project Manager	2	7	Hr	\$150.00	14	\$2,100.00
1.5.5.10	134	Completion of Concrete floors and roof	Milestone	General Contractor	0	0	0	\$0.00	0	\$0.00
1.5.6.1	136	Rough-in plumbing at toilets and masonry walls	Install or run plumbing infrastructure for toilets, as outlined on drawings.	Plumbing Contractor	2	7	Hr	\$200.00	14	\$2,800.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.6.2	138	Install exterior and interior masonry work	Construct all masonry walls.	General Contractor	44	7	Hr	\$375.00	308	\$115,500.00
1.5.6.3	140	Construct lintels and kickers	Construct in places lintels and kickers	General Contractor	15	7	Hr	\$35.00	105	\$3,675.00
1.5.7.1.1	142	Fabricate and install roof trusses and roof framing over main roof and walkways	Construct as per specifications roof trusses and hoist in place. Install roof framing in relevant areas as per drawings and specifications.	Civil / Structural Engineer, General Contractor	30	7	Hr	\$528.00	210	\$110,880.00
1.5.7.1.2	144	Install metal work to secure roof trusses and rafters, and pour lightweight concrete roof fill	Install all structural metal plates in respective location for securing roof trusses in place and mix and pour concrete roof filling to upper section of ream beam to upper level of roof truss.	General Contractor	2	7	Hr	\$1,500.00	14	\$21,000.00
1.5.7.1.3	146	Install felt seamless roofing material, flashing and metal guttering	Lay and secure in place specified roofing felt, roofing material, flashing, and guttering.	General Contractor, Roofing Contractor	3	7	Hr	\$950.00	21	\$19,950.00
1.5.7.1.4	148	Completion of Masonry and Carpentry work	Milestone	General Contractor	0	0	0	\$0.00	0	\$0.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.7.2.1	150	Install suspended ceiling framing.	Setout and install suspended ceiling grid on the interior ceiling zone of buildings.	General Contractor, Carpenter / Joiner Contractor	7	7	Hr	\$249.00	49	\$12,201.00
1.5.7.3.1	152	Install door frames and make good all window openings	Install in place all door frames as per specifications and	General Contractor, Carpenter / Joiner Contractor	5	7	Hr	\$465.00	35	\$16,275.00
1.5.7.3.2	154	Install doors, windows, and ironmongery hardware	Fix in place all doors and windows including hinges, locks, door stops door sweeps etc.	General Contractor, Carpenter / Joiner Contractor	4	7	Hr	\$2,500.00	28	\$87,500.00
1.5.7.4.1	156	Install solid surfaces, prefabricated bathroom partitions and vanities	Fix in place all countertops to receive vanities and all prefabricated toilet partitions etc.	General Contractor, Carpenter / Joiner Contractor	6	7	Hr	\$805.00	42	\$33,810.00
1.5.7.4.2	158	Fabricate and install Kitchen cabinets storage cupboards and open shelving	Construct and install all kitchen cupboards and shelving.	General Contractor, Carpenter / Joiner Contractor	25	7	Hr	\$350.00	175	\$61,250.00
1.5.7.4.3	160	Completion of installation of ceiling, doors, windows, and built-in furniture	Milestone	General contractor	0	0	0	\$0.00	0	\$0.00
1.5.7.5.1	162	Plaster all walls and screed all internal Floors	Using specified cement mortar mix render finish all walls and internal floors.	General Contractor, Masonry Contractor	25	7	Hr	\$325.00	175	\$56,875.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.7.5.2	164	Install ceramic floor tiling	Lay ceramic floor tile using specified bonding and finishing agent and to specified design pattern.	General Contractor, Tiling Contractor	16	7	Hr	\$685.90	112	\$76,820.80
1.5.8.1	166	Paint walls and woodwork	Apply one coat primer and two finish paint to all internal and external and woodwork.	Clerk of Works, General contractor, Painting contractor, Project Manager	20	7	Hr	\$329.50	140	\$46,130.00
1.5.8.2	168	Install conduit at ceiling plenum space.	Run all conduits for service infrastructure in ceiling plenum.	Clerk of Works, Electric Contractor, General Contractor	4	7	Hr	\$240.00	28	\$6,720.00
1.5.8.3	170	Install ceiling tiles	Fix in place all ceiling tiles	Carpenter / Joiner Contractor, Clerk of Works, General Contractor	4	7	Hr	\$250.00	28	\$7,000.00
1.5.8.4	172	Install hardware and accessories	Secure and fix in place all hardware and supporting accessories.	General Contractor	3	7	Hr	\$275.00	21	\$5,775.00
1.5.8.5	174	Pave, curb, and strip parking lot	Construct curb wall along building exterior as per drawings and specifications and grade parking lot.	General Contractor, Paving Contractor, Project Manager, Site Excavation Contractor	5	7	Hr	\$200.00	35	\$7,000.00
1.5.8.6	176	Completion of all plastering and building finishes	Milestone	General Contractor	0	0	0	\$0.00	0	\$0.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.9.1	178	Rough-in plumbing in walls, Set plumbing fixtures and trim	Install or run plumbing infrastructure through walls for sinks and trims, as outlined on drawings.	General contractor, Plumbing Contractor	3	7	Hr	\$120.00	21	\$2,520.00
1.5.9.1.2	180	Tie-in fire line riser and set valves	Install all fire line risers and set valves for fire Suppressant system.	General contractor, Plumbing Contractor	2	7	Hr	\$120.00	14	\$1,680.00
1.5.9.1.3	182	Flush, test, and clean piping and fixtures	Flush test all plumbing pipes, fixtures, and systems.	General contractor, Mechanical Consultant, Plumbing Contractor	3	7	Hr	\$120.00	21	\$2,520.00
1.5.9.2.1	184	Rough-in electrical in interior and exterior walls	Install or run all electrical infrastructure through walls as specified on drawings.	Clerk of Works, Electric Contractor, General Contractor	5	7	Hr	\$120.00	35	\$4,200.00
1.5.9.2.2	186	Pull wire in conduit and set area transformers	Pull all electrical wires through conduits and set in area transformers.	Clerk of Works, Electric Contractor, General Contractor	10	7	Hr	\$480.00	70	\$33,600.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.5.9.2.3	188	Install and terminate electrical devices	Install and terminate all electrical outlets, switches, and panels etc.	Clerk of Works, Electric Contractor, General Contractor	4	7	Hr	\$520.00	28	\$14,560.00
1.5.9.2.4	190	Install light fixtures - test and clean	Install all lights and fixtures in place, test all electrical circuits and conduct final clean of installation.	Clerk of Works, Electric Contractor, General Contractor	8	7	Hr	\$240.00	56	\$13,440.00
1.5.9.2.5	192	Completion of all mechanical, electrical and plumbing installations	Milestone	General Contractor	0	0	0	\$0.00	0	\$0.00
1.5.11.1	194	Pour concrete on driveway, parking, and sidewalks	Concrete is transported to site and poured in place for driveways, Parking, and sidewalks.	Civil / Structural Engineer, Clerk of Works, Concrete Contractor, General contractor	6	7	Hr	\$2,172.00	42	\$108,024.00
1.5.11.2	196	Sod and complete plantings - building exterior	Lay slabs of grass and complete planting of all flora and fauna as per landscape architecture plan.	Clerk of Works, General Contractor, Landscape Contractor	5	7	Hr	\$480.00	35	\$16,800.00
1.5.11.3	198	Completion of construction phase	Milestone	General Contractor	0	0	0	\$0.00	0	\$0.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.6.1	200	Obtain certificate of occupancy	Obtain certificate indicating building is safe for occupancy.	Chief Architect	2	7	Hr	\$75.00	14	\$1,050.00
1.6.2	202	Issue final completion documents including warranties	Prepare and issues to contractor successful completion letter and taking over certificate to sign off and commence defects liability period for works realized.	Chief Architect, Project Manager	3	7	Lumpsum	\$600.00	1	\$600.00
1.6.3	204	Issue final request for payment	Prepare, certify, and issue final payment certificate to accounts debt for payment to contractor.	Chief Architect, Quantity Surveyor	1	7	Lumpsum	\$600.00	1	\$600.00
1.7.1	206	Completion of works	Complete all works	Chief Architect, General contractor, Project Manager	1	7	Lumpsum	\$1,500.00	1	\$1,500.00
1.7.2	208	Dry Run/ Test run	Conducting a test run of all building, plant, and equipment for adherence to standards and safety requirements.	Chief Architect, Clerk of Works, Electrical Consultant, General Contractor, Plumbing Consultant, Project Manager	2	7	Hr	\$300.00	14	\$4,200.00

WBS Code	Activity Code	Activity Name	Activity Description	Resources	Duration workday(s)	Working Day (Hr)	Unit	Rate	Quantity	Amount
1.8.1	210	Submit final reports (commissioning, inspection, and testing) including lessons learned.	Prepare and submit final reports.	Chief Architect, Project Manager	2	7	Lumpsum	\$800.00	1	\$800.00
1.8.2	212	Obtain approval to close project	Obtain written approval to close project.	Chief Architect, Project Manager	2	7	Lumpsum	\$600.00	1	\$600.00
1.8.3	214	Contractor demobilization	Formal notice is delivered to clear site of all construction equipment, machinery, tool etc. and conduct a post construction cleaning exercise.	Chief Architect, Project Manager	5	7	Hr	\$250.00	35	\$8,750.00
1.8.4	216	Project Hand over	Formal hand over of project to client / owner.	Chief Architect, General Contractor, Project Manager	1	7	Lumpsum	\$600.00	1	\$600.00
1.8.5	218	Project Completion	Milestone		0	0	0	\$0.00	0	\$0.00
					Total				\$	1,623,324.84

4.4.6 Determine Budget

According to PMBOK®Guide, 6th edition (2017), Determine Budget is the process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline. A project budget helps set expenditure expectations and is critical in getting project approval, ensuring funds are ready at the right time, and measuring performance. It is a dynamic document, continuously monitored, reviewed, and updated throughout the project (AIPM, 2021).

The project budget will be an essential document for the project's decision-making processes and will communicate to stakeholders the needs of the project (financial, human resource, materials, equipment, training etc.); additionally, it will provide a baseline or guide for the project manager to keep track of project expenditures while bringing to light critical areas needing attention. It will define skill sets proposed tasks and will require a period of use to realize work activities. The project budget will assist in prioritization of activities and promoting strategic planning for measuring performance against actual cost as the project matures.

The inputs used to determine the budget for the design and construction of the Center for Adolescent Renewal and Education will be the Project Management Plans including the Cost Management Plan, Resource Management Plan and the Scope Baseline. The tools and techniques used in this process will be expert judgement and the use of historical and financing data. This process will lead to obtaining the cost baseline for the project and updates to the project schedule and risk register for the

project. The contingency reserves and management reserves for the project will be 15% and 3% respectively as per the Public Procurement and Asset Disposal Amendment Act (2020).

The budget chart for the project is depicted below in Chart No. 22:

Chart No. 22 Project Budget e.g. (Source: Georges, L.B., Author, June 2023)

PROJECT BUDGET CHART			
Project Number	2031	Project Name	Project Manager
		Design and Construction of the Center for Adolescent Renewal and Education	Lyndon B Georges

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.2.1	Client / Architect Appraisal Meeting.	Receive clients' instructions and statements of requirements to formulate and advise client on a strategic course of action.	\$1,050.00
1.2.2	Site Familiarization, Visit and Investigation	Visit the proposed site to gather information and obtain visual characteristics of its immediate urban environment.	\$2,100.00
1.2.3	Develop Project Charter	Develop a formal document that lays out the project vision, scope, objectives, project team and their responsibilities etc.	\$4,200.00
1.2.4	Establish Project Team	Compile the group of individuals who will be engaged in the design and implementation of the project.	\$1,050.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.2.5	Conduct Feasibility Study and Report	Assess the site and its urban environment to determine the practicality of the proposed project, taking into consideration all pros and cons associated with the same and generate a final report.	\$15,750.00
1.3.1	Conduct Conceptual Studies and prepare Design Solutions	Develop project brief and explore studies illustrating spatial relationship, massing and circulation and services systems.	\$10,500.00
1.3.2	Develop Budgetary Costing	Prepare in collaboration with quantity surveyor a statement of probable cost of construction based on the conceptual design.	\$5,250.00
1.3.3	Conduct concept presentation and obtain stakeholder feedback, including change request	Conduct presentation using graphical representation of the design and receive and receive feedback from key stakeholders for possible design alterations etc.	\$1,820.00
1.3.4	Develop schematic proposal and conduct presentation No. 02	Conduct design modification as per change requests through outlined proposal and present to project stakeholders.	\$6,825.00
1.3.5.1	Realize final design and budgetary costing adjustments/modifications	Final outlined project proposal describing size and character of entire project to include architectural, engineering systems, materials, building placement on site etc.	\$10,500.00
1.3.5.2	Conduct Final Presentation	Graphical presentation of the finalized project.	\$315.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.3.5.3	Coordinate consultancy services	Contract consultants and collaborate to prepare full coordinated set of architectural and engineering drawings, schedules, and specifications for tender processes.	\$10,080.00
1.3.5.4	Prepare construction set of drawings	The design team prepares and collates the set of drawings to guide the building construction and for use to obtain building permits.	\$57,750.00
1.3.6.1, 1.3.6.2, 1.3.6.3, 1.3.6.4, 1.3.6.5,	Secure Permits (Solid Waste Management, Infrastructural, Public Health, Fire Safety & Prevention, Development Control Authority)	Make submission of documents and construction drawing to statutory bodies for approval and building permits.	\$19,516.00
1.3.7	Develop final Bill of Quantities	Prepare a statement of cost of construction using the construction set of drawings and specifications.	\$3,150.00
1.3.8	Completion of Architectural Design and receipt of permits	Milestone	\$0.00
1.4.1.1	Issue Notice of Expression of Interest	Advertise in the national gazette a notice of expression of interest to tender on the construction of the project.	\$300.00
1.4.1.2	Receipt bidder packages	Receive sealed packages from interested bidders with requisite information as per 1.4.1.1.	\$300.00
1.4.1.3	Conduct pre-qualification exercises	Evaluation team to open individual bids and assess validity of information provided against the requirements of the Procurement and Stores Act for this intervention.	\$2,625.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.4.2.1	Prepare request for proposal and collate supporting documents	Collate tender documents, and construction drawings to enable tenders to be placed and provide information for preparation of pre-tender cost estimates.	\$4,200.00
1.4.3	Submission and receipt of proposal	Submit tender packages to bidders and receive completed packages on the stipulated date and time.	\$3,675.00
1.4.4.1	Consider and conduct evaluation of financial proposals and select successful proposal	Evaluation team evaluates bid submissions and selects a qualifying bidder.	\$10,500.00
1.4.4.2	Prepare evaluation report	Prepare a detailed statement on the evaluation methodology used and the justification for the winning bidder.	\$6,720.00
1.4.4.3	Submit report to Public Procurement Board	Submit evaluation report and all supporting appendices.	\$490.00
1.4.5.1	Schedule Public Procurement Board meeting	Schedule meeting to discuss evaluation report and winning bidder.	\$300.00
1.4.5.2	Presentation of Evaluation Report	Present report to procurement board.	\$300.00
1.4.5.3	Receipt of formal approval letter	Receive approval letter to proceed to negotiations and contracting from Central Procurement Unit.	\$300.00
1.4.5.4	Negotiation of successful proposal	Negotiate a reduced construction cost with winning bidder.	\$500.00
1.4.8.1	Review and collate contract documents	Vet and collate construction contract.	\$3,150.00
1.4.8.2	Award and Signing of Contract	Award and signing of contract by relevant parties.	\$300.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.4.8.3	Conduct Public Awareness exercise	Conduct townhall and constituency meeting as well as media broadcasts to engage and inform the public and neighboring communities of the proposed project intervention.	\$12,600.00
1.4.8.4	Completion of Procurement	Milestone	\$0.00
1.5.1	Contractor mobilization	Allowing a time period before commencement of construction activities for contractor to mobilize all material, plant, and equipment.	\$25,000.00
1.5.2.1	Survey and measure road	Surveyor establishes reference parameters for road.	\$3,500.00
1.5.2.2	Excavate existing road drain and secure precast concrete culverts.	Remove topsoil and silt and debris from drain to solid base and place reenforce concrete culverts.	\$2,100.00
1.5.2.3	Pour and grade sub-base and compact.	Pour sub-base material and grade to obtain a level road surface and compact as per engineering specifications.	\$840.00
1.5.2.5	Test road surface	Conduct vehicular traffic test over newly built road to assure it meets required standards.	\$3,000.00
1.5.1.1	Install temporary potable water and electricity.	Electrical and water service providers conduct installation of temporary services for construction phase.	\$2,500.00
1.5.1.2	Set up site office	Build or transport in place site office for managing construction activities.	\$5,000.00
1.5.1.3	Set out building and grade benchmarks	Survey and place batter boards to establish reference points for building placement and commence ground grading as necessary.	\$14,000.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.5.1.4	Prepare site - lay down yard and temporary fencing	Establish building, plant, equipment, and traffic circulation zones on site and construct protective fencing with placement of all required signage.	\$17,500.00
1.5.4.1	Excavate foundations and dispose of excavated material	Excavation of all building foundation zones to required depth and dispose of excavated material in waterlogged zone on site.	\$21,325.29
1.5.4.2	Realize termite treatment	Treatment of ground for termites.	\$3,570.00
1.5.4.3	Prepare and place sawn formwork and install rebar for in-ground beams and strip footings	Measure, prepare and place formwork to receive structural reinforcement for casting ground beams as per engineering specifications.	\$77,840.00
1.5.4.4	Pour concrete for foundations and ground beams	Concrete is transported to site and poured in place for foundations and ground beams	\$46,719.75
1.5.4.5	Perform foundation inspection	Conduct rebound hammer test or similar inspections on cured concrete foundations to assure they meet required standards.	\$980.00
1.5.4.6	Place hardcore filling and lay damp proof membrane	Transport to site and dump and place specified hardcore material within enclosed foundation zone, compacting as specified and finishing with placement of the damp proof membrane.	\$31,500.00
1.5.4.7	Completion of Foundations	Milestone	\$0.00
1.5.5.1	Prepare and place sawn formwork to sides of ground beams and strip footing.	Secure formwork to constructed ground beams and reference height of structural floor around entire building enclosure.	\$3,675.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.5.5.2	Install rebar mesh fabric reinforcement, and in-floor utilities (including mechanical, electrical, plumbing) for ground floor slab	Installs all structural reinforcement as per engineering specification and all mechanical, electrical, and plumbing infrastructure.	\$15,750.00
1.5.5.3	Pour and cure ground floor slab	Transport concrete and pour in place as per specifications and allow to cure for specified time period.	\$12,194.00
1.5.5.4	Strip forms from ground floor	Remove all formwork when concrete has cured.	\$1,120.00
1.5.5.5	Prepare and place sawn formwork to sides of roof slab including all canopies and parapets	Secure and strut formwork to constructed ream beams or blockwork and reference height of structural roof slab, canopies, and parapets.	\$61,635.00
1.5.5.6	Install rebar Mesh fabric Reinforcement, and in-slab utilities (including mechanical, electrical, plumbing) for roof slab	Installs all structural reinforcement as per engineering specification and all mechanical, electrical, and plumbing infrastructure.	\$84,504.00
1.5.5.7	Pour and cure roof slab, canopies, and parapets.	Transport concrete and pour in place as per specifications and allow to cure for specified time period.	\$82,530.00
1.5.5.8	Strip forms from roof slab.	Remove all formwork when concrete has cured.	\$1,120.00
1.5.5.9	Perform ground floor, roof slab, canopies, and parapets inspection	Conduct rebound hammer test or similar inspections on cured concrete.	\$2,100.00
1.5.5.10	Completion of Concrete floors and roof	Milestone	\$0.00
1.5.6.1	Rough-in plumbing at toilets and masonry walls	Install or run plumbing infrastructure for toilets, as outlined on drawings.	\$2,800.00
1.5.6.2	Install exterior and Interior masonry work	Construct all masonry walls.	\$115,500.00
1.5.6.3	Construct lintels and kickers	Construct in places lintels and kickers	\$3,675.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.5.7.1.1	Fabricate and install roof trusses and roof framing over main roof and walkways	Construct as per specifications roof trusses and hoist in place. Install roof framing in relevant areas as per drawings and specifications.	\$110,880.00
1.5.7.1.2	Install metal work to secure roof trusses and rafters, and pour lightweight concrete roof fill	Install all structural metal plates in respective location for securing roof trusses in place and mix and pour concrete roof filling to upper section of ream beam to upper level of roof truss.	\$21,000.00
1.5.7.1.3	Install felt, seamless roofing material, flashing and metal guttering	Lay and secure in place specified roofing felt, roofing material, flashing, and guttering.	\$19,950.00
1.5.7.1.4	Completion of Masonry and Carpentry work	Milestone	\$0.00
1.5.7.2.1	Install suspended ceiling framing.	Setout and install suspended ceiling grid on the interior ceiling zone of buildings.	\$12,201.00
1.5.7.3.1	Install door frames and make good all window openings	Install in place all door frames as per specifications and realize all finishing or corrective works for window openings	\$16,275.00
1.5.7.3.2	Install doors, windows, and ironmongery hardware	Fix in place all doors and windows including hinges, locks, door stops door sweeps etc.	\$87,500.00
1.5.7.4.1	Install solid surfaces, prefabricated bathroom partitions and vanities	Fix in place all countertops to receive vanities and all prefabricated toilet partitions etc.	\$33,810.00
1.5.7.4.2	Fabricate and install kitchen cabinets, storage cupboards and open shelving	Construct and install all kitchen cupboards and shelving.	\$61,250.00
1.5.7.4.3	Completion of installation of ceiling, doors, windows, and built-in furniture	Milestone	\$0.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.5.7.5.1	Plaster all walls and screed all internal Floors	Using specified cement mortar mix render finish all walls and internal floors.	\$56,875.00
1.5.7.5.2	Install ceramic floor tiling	Lay ceramic floor tile using specified bonding and finishing agent and to specified design pattern.	\$76,820.80
1.5.8.1	Paint walls and woodwork	Apply one coat primer and two finish paint to all internal and external and woodwork.	\$46,130.00
1.5.8.2	Install conduit at ceiling plenum space.	Run all conduits for service infrastructure in ceiling plenum.	\$6,720.00
1.5.8.3	Install ceiling tiles	Fix in place all ceiling tiles	\$7,000.00
1.5.8.4	Install hardware and accessories	Secure and fix in place all hardware and supporting accessories.	\$5,775.00
1.5.8.5	Pave, curb, and strip parking lot	Construct curb wall along building exterior as per drawings and specifications and grade parking lot.	\$7,000.00
1.5.8.6	Completion of all plastering and building Finishes	Milestone	\$0.00
1.5.9.1	Rough-in plumbing in walls, Set plumbing fixtures and trim	Install or run plumbing infrastructure through walls for sinks and trims, as outlined on drawings.	\$2,520.00
1.5.9.1.2	Tie-in fire line riser and set valves	Install all fire line risers and set valves for fire Suppressant system.	\$1,680.00
1.5.9.1.3	Flush test, and clean piping and fixtures	Flush test all plumbing pipes, fixtures, and systems.	\$2,520.00
1.5.9.2.1	Rough-in electrical in interior and exterior walls	Install or run all electrical infrastructure through walls as specified on drawings.	\$4,200.00
1.5.9.2.2	Pull wire in conduit and set area transformers	Pull all electrical wires through conduits and set in area transformers.	\$33,600.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.5.9.2.3	Install and terminate electrical devices	Install and terminate all electrical outlets, switches, and panels etc.	\$14,560.00
1.5.9.2.4	Install light fixtures - test and clean	Install all Lights and fixtures in place, test all electrical circuits and conduct final clean of installation.	\$13,440.00
1.5.9.2.5	Completion of all Mechanical, Electrical and Plumbing Installations	Milestone	\$0.00
1.5.11.1	Pour concrete on driveway, parking lot, and sidewalks	Concrete is transported to site and poured in place for driveways, parking lot, and sidewalks.	\$108,024.00
1.5.11.2	Sod and complete plantings - building exterior	Lay slabs of grass and complete planting of all flora and fauna as per landscape architecture plan.	\$16,800.00
1.5.11.3	Completion of construction Phase	Milestone	\$0.00
1.6.1	Obtain certificate of occupancy	Obtain certificate indicating building is safe for occupancy.	\$1,050.00
1.6.2	Issue final completion documents including warranties	Prepare and issues to contractor successful completion letter and taking over certificate to sign off and commence defects liability period for works realized.	\$600.00
1.6.3	Issue final request for payment	Prepare, certify, and issue final payment certificate to accounts debt for payment to contractor.	\$600.00
1.7.1	Completion of works	Complete all works	\$1,500.00
1.7.2	Dry Run/ Test run	Conducting a test run of all building, plant, and equipment for adherence to standards and safety requirements.	\$4,200.00

ACTIVITY ID	ACTIVITY NAME	ACTIVITY DESCRIPTION	COST
1.8.1	Submit final reports (commissioning, inspection, and testing) including lessons learned.	Prepare and submit final reports.	\$800.00
1.8.2	Obtain approval to close project	Obtain written approval to close project.	\$600.00
1.8.3	Contractor demobilization	Formal notice is delivered to clear site of all construction equipment, machinery, tool etc. and conduct a post construction cleaning exercise.	\$8,750.00
1.8.4	Project Hand over	Formal hand over of project to client / owner.	\$600.00
1.8.5	Project Completion	Milestone	\$0.00
	Base cost		\$1,623,324.84
	Contingency reserve (10%)	10 % of Estimated cost	\$162,332.48
	Cost Baseline	Estimated cost-plus 10% contingency reserve	\$1,785,657.32
	Management Reserve	3% of base cost	\$48,699.75
	Total Estimated Cost		\$1,834,357.07

4.4.7 Control Cost

Control cost function as defined by PMBOK®Guide 6th edition, 2017 allows for monitoring the status of a project for project cost updating and managing of cost baseline changes. This ensures product costs adherence to established cost baseline through monitoring and analysis and of project expenditures throughout the project lifecycle. Controlling cost is advantageous because it allows for monitoring of cost variances from the established plan and enables the project manager/ project team to take corrective action to reduce negative risk implications to the project.

The design and construction of the Center for Adolescent Renewal and Education project will utilize the earned value management (EVM) method approach to calculate cost variances that will determine the project's budgetary performance: underbudget, at budget, or over budget. Earned value management (EVM) is a tool to measure project performance and allows for the evaluation of the project's current status, while simultaneously comparing the projected plan against actual execution. It is also useful for realizing project forecasts.

This project has a fixed budget and a tight schedule; therefore, any negative variation reported in the cost performance index and cost variance will be considered unfavorable. The project manager will calculate the actual costs for all the WBS elements and compare these to the projected baseline costs on a weekly basis. The comparisons will be used to generate data and produce status reports that will form the basis for the CPI and CV ratios. Variances will be calculated by

deducting the actual costs from the earned value. If the variance for the project is equal to "0", the project will be considered to be on budget, if the variance is negative the project will be over budget and if positive the project will be under budget.

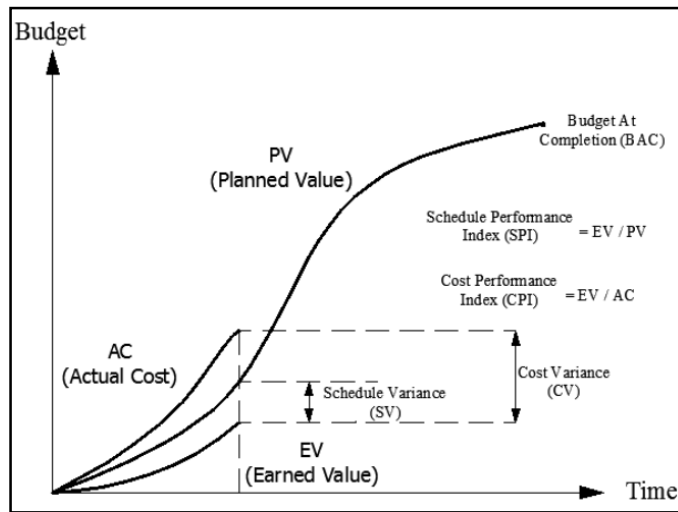
Earned value metrics will also be utilized to analyze the project's cost using the following:

- Cost Performance Index (CPI)
- Schedule Performance Index (SPI)
- Cost Variance (CV)
- Schedule Variance (SV)

For the design and construction of the Center for Adolescent Renewal and Education project, an SPI and CPI greater than one indicates that the Schedule Performance and Cost Performance are favorable whilst an SPI and CPI calculation which is less than one indicates an unfavorable condition. An unfavorable SPI and CPI will prompt discussions amongst the project manager and project team as to the measures which will be needed to control costs for the project. Any deviation from the cost baseline will trigger a change request to accommodate the new cost. Authorization will be either from the Permanent Secretary (if deviation is within the limits of the available contingency amount) or from the Change Control Board if deviation surpasses project cost.

Figure No. 24 below depicts the earned value management graph for measuring project performance.

Figure 24 Earned Value Management e.g. (Source: Georges, L.B., Author, June 2023)



Note. From Researchgate.net, Copyright 2023.

4.4.1 Cost Management Plan Approval

The signatures of the people below indicate an understanding of the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.5 PROJECT QUALITY MANAGEMENT

Quality Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

4.5.1 Introduction

According to (PMBOK®Guide, 6th edition, 2017), Project Quality Management includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project, and product quality requirements, in order to meet stake holder objectives. A Quality Management plan is a product of the project and program management plan that describes how applicable policies, procedures and guidelines will be implemented to achieve the quality objectives.

The Quality Management plan for the Design and Construction of the Center for Adolescent Renewal and Education will establish activities, processes, and procedures to ensure that implementation adheres to TVET, quality standards and national building codes.

The Project Quality Management processes are defined as:

- Plan Quality Management
- Manage Quality
- Control Quality

4.5.2 Plan Quality Management

The Plan Quality Management process for the design and construction of the Center for Adolescent Renewal and Education will involve identifying quality requirements and standards that will guide the project to achieving success throughout its life cycle. During the design stage, office standards for development of architectural and construction drawings will be used to define drawing setup, drawing conventions, inter alia quality assurance program, TVET standards for Schools. During the implementation stage, the OECS building code in conjunction with Caricom Regional Energy Efficiency Standards, inter alia Engineering codes will be used to measure quality of sub and main deliverables.

The project schedule, Activity list and Budget Chart will be used as source documents to manage and schedule quality assessments throughout the construction phase. Additionally, site meetings, site visits and walk throughs, expert judgment, data analysis will be tools that will be frequently used for quality assurance purposes. Other inputs used for this process will be the Project Charter, Project Management Plan, project documents, enterprise environmental factors and organizational process assets.

Summary of steps taken to Plan for Quality:

- Be clear on the quality policy that is in place to elaborate the quality management plan.
- Determine the team members' responsibility for adequate accountability in the process.
- Define performance targets ensuring the understanding of the acceptance criteria, for quality, for each deliverable.
- Define the processes, resources, and standards for achieving quality benchmarks.
- Documenting and approval of the quality management plan

The Roles and responsibilities for controlling Quality is depicted below in Chart No.23

4.5.3 Roles and Responsibilities

Chart No. 23 Roles and Responsibilities (Source: Georges, L.B., Author, June 2023)

Roles/Name	Responsibilities
Project Sponsor	<ul style="list-style-type: none"> • Approves quality Management Plan • Receives quality approval reports and certificates periodically upon completion of work stages.
Project Manager/ Chief Architect	<ul style="list-style-type: none"> • Oversees all quality management activities by project team and certifies actioning and the same in accordance with standards and requirements. • Addresses risk and issues related to quality to stakeholders. • Implements quality assurance and control techniques to control project deliverables.
Project Architect	<ul style="list-style-type: none"> • Reports to project manager on all matters relating to quality. • Provides general oversight of implementation of quality standards by the project team.
Project Team	<ul style="list-style-type: none"> • Works with consultants and on-site supervisors to ensure that quality controls are implemented as planned and that quality is measured as per standards. • Keeps records of all quality interventions for further approval by the Project Architect. • Performs quality.
International Labour Organization	<ul style="list-style-type: none"> • Sponsors representative and receives all quality approval reports on behalf of the sponsor.
CARE	<ul style="list-style-type: none"> • Receives updates and reports on quality Assurance implementation exercises at periodical steering committee meetings.
Ministry of Education	Receives updates and reports on quality Assurance implementation exercises at periodical steering committee meetings.

Roles/Name	Responsibilities
Governmental Statutory Agencies.	Performs periodical construction site visits to measure and supervise that quality standards are being adhered to.
Contractors	Realizes work activities through the use of quality standards and specifications as per certified designs.

4.5.4 Manage Quality / Quality Assurance

Manage quality is the process of translating the quality management plan into executable quality activities that incorporate the organization’s quality policies into the project (PMBOK®Guide, PMBOK®Guide, 6th edition, 2017).

For the design and construction of the Center for Adolescent Renewal and Education, manage quality will be implemented by means of quality assurance Programs. Quality control procedures will be integrated into design and production activities to improve and facilitate the design revision process and during construction activities to ensure that finish products adhere to required standards, for a healthy and safe building and building environment. Managing Quality / quality assurance will be the primary responsibility of the Chief Architect and Project Architect (s) hierarchically, within the Department of Physical Development and Urban Renewal. An additional team member (architectural assistant) will in most circumstances collaborate with the project architect in executing the responsibilities. Consultants will be held accountable for ensuring that corresponding quality assurance program is agreed upon and communicated to the chief architect prior to contract signing, for design and construction stages.

Contractors will be expected to have a quality assurance plan approved by the chief architect and validated for implementation throughout the project's life cycle. The quality assurance processes to be used include measuring metrics, lessons learnt from previous projects, analyzing process data, quality control and recommending changes if necessary.

Summary of steps taken to perform quality assurance:

- Communicate all doubts, queries, and requests relating to project schedule and implementation plan from the subcontracting agency through to the general contractor.
- Establish and document standard operating procedures useful to guide the project processes, and foster transparency.
- submission of relevant status reports, inspection, and testing information etc. as timetable from inception to completion.
- Analyze existing needs, conditions and information gathering methods for implementing, and improve processes aligned purposes.
- Identify quality standards being used for all processes and review for accuracy, precision, and current status.
- Establish information recording systems from the use of standards and scheduled submission of the same in accordance with project schedule at agreed milestones.

4.5.5 Control Quality

PMBOK®Guide, 6th edition (2017) indicates that quality control is a process of monitoring and recording the results of executing the quality management activities to assess project performance and ensure the project outputs are complete, correct, and meet customer expectations. The process determines whether project outputs comply with applicable standards, requirements, regulations, and specifications and determines whether corrective action is to be taken.

The project team will apply quality control immediately upon commencing quality management, with emphasis on monitoring project results to identify compliance and non-compliance, determine the cause of the non-compliance and provide the necessary corrective action. For this purpose, bi-weekly site inspections will be conducted by the project architect, project engineer, quantity surveyor and architect's assistant to monitor work in progress and to ensure that work activities are realized in accordance with design specification and in compliance with relevant standards and codes of practice. Progress reports will be developed following each site meeting and walk-through, to document status of project implementation and ensure alignment to the project scope. Cost and schedule will be monitored by examining planned results against actual results to identify variances and determine corrective actions to perform.

Quality control criteria will be used to control quality during the Design and construction Phases of the Center for Adolescent Renewal and Education. These quality criteria's will be industry standards, regulations, contractual Agreements, and internal policies governing the realization of service of that nature. NFPA 72®, OECS building code, TVET standards, UK Transport and Road Research Laboratory (TRRL)-Road note 6 and AASHTO (American Association of State, Highway and Transportation Officials) standard, inter alia, serve as benchmarks or Matrices to measure and control quality.

Daily audits will be conducted by the project manager and team, of works and records kept for work in progress or issues encountered. Material samples will be taken prior to the commencement of work and subsequently tested in accordance with the relevant standards where applicable. Testing is vital to controlling quality especially during the construction Phase. Concrete slump tests will be undertaken prior to pouring Concrete for floors, roof and roof canopies to assess the consistency of the concrete, while concrete strength tests will be conducted to test the capacity of concrete to withstand loading before experiencing failure.

the tests being conducted during the construction of the project are:

- Slump tests
- Comprehensive strength of concrete test
- Asphalt tests

The Charts No. 24 and 25 below depicts the Quality Assurance Matrix and Quality Assurance Log for daily quality control recording and tracking project work :

Chart No. 24 Quality Assurance Matrix Template (Source: Georges, L.B., Author, June 2023)

Quality Assurance Matrix							
Project Name	Design and Construction of the Center for Adolescent Renewal and Education		Revision Date:	xx			
Project Number	2031		Document Number	QAM-ASEC-001			
Chief Architect / Project Manager	Project Architect	Contractor		PM Team (Name Initials)			
Lyndon B Georges	xx	xx		xx	xx	xx	xx



ID	Category	Item	Description	Measurement Method	Matrix	Drawing Reference	Statistical Sampling
SF-01	Strip footing	Structural Concrete	In situ (Cast in place)	Compressive test	4000 psi (@ (28 days)	SS-01	2 - 3 concrete cylinders per footing.
		Reinforcing steel	Tensile (fy) High yield steel bar reinforcement.	-10mm & 12mm Ø bars- ground beam. -20mmØbars ground beam -Fabric Reinforcement	BS 4461, BRC A-193	SS-05	3.0 tons per diameter per kind
signed			Project Architect- xxx			Date: March 4 th 2023	
Approved			Chief Architect- 			Date: March 4 th 2023	

Chart No. 25 Quality Assurance Log Template (Source: Georges, L.B., Author, June 2023)

Quality Assurance Log										
Project Name	Design and Construction of the Center for Adolescent Renewal and Education			Revision Date:	xx					
Project Number	2031			Document Number	QAL-ASEC-001					
Chief Architect / Project Manager	Project Architect		Contractor		Sub-Contractor		PM Team (Name Initials)			
Lyndon B Georges	xx		xx		xx		xx	xx	xx	xx
ID	Date Measured	Process Measured	Results		Comments / Recommendations	Quality Evaluator	Resolved (√)		Date Resolved	
			Required	Actual			Y	N		
S-01	Y/M/D	Formwork and placement of ground floor reinforcement	xyz	xyz	Xxxxxx	Jane Doe	√		Y/M/D	
signed			Project Architect- xxx				Date: March 4 th 2023			
Approved			Chief Architect- 				Date: March 4 th 2023			

Summary of steps taken to Control quality:

- Review all project documents such as Lessons Learned Register, Quality Metrics, Test, and evaluation documents.
- Establish Data gathering, data Analysis and data representation of current and new data generated with continuous improvement.
- Establish effective inspection procedures to include measuring, testing, and examining all project work ensuring completion of deliverable and performance to the required standards.
- Establish an efficient change control process to ensure that changes are communicated and reviewed for avoidance of rework or miscommunication.
- Conduct regular meetings and site visits.


The Chart No. 26 below depicts a checklist for tracking work progress for the project during the design Stage:

Chart No. 26 Architectural Design Development Checklist Template (Source: Georges,

L.B., Author, June 2023)


Architectural Design Development Checklist									
Project Name	Design and Construction of the Center for Adolescent Renewal and Education			Revision Date:					
Project Number	2031			Document Number	DCL-ASEC-001				
Chief Architect / Project Manager	Project Architect		Lead Assistant		Technicians (Name Initials)				
Lyndon B Georges	xx		xx		xx	xx	xx	xx	xx

Drawings Designation	Status		Percentage Completion (%)	Comments	Team Member
	On-going	Pending			
Coversheet					
Drawing index					
Job Name etc.					
Site plan					
North sign					
Building outline					
Storm drains etc.					
Foundation plan (s)					
Walls					
Footings					
Columns etc.					
Floor Plans					
Dimensions					
Ramps etc.					
Elevations					
Materials					
Windows/doors etc.					
Sections					
Dimensions					
Annotation etc.					
Assemblies / Details					
Roof details					
Millwork details					
Closets etc.					

Components				
Stairs				
Ceiling etc.				
Schedules and Diagrams				
Room finish				
Door and Window				
Equipment etc.				
signed	Project Architect- xxx			Date: March 4 th 2023
Approved	Chief Architect-			Date: March 4 th 2023

4.5.6 Quality Management Plan Approval

The signatures of the people below indicate an understanding of the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.6 PROJECT RESOURCE MANAGEMENT

Resource Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

4.6.1 Introduction

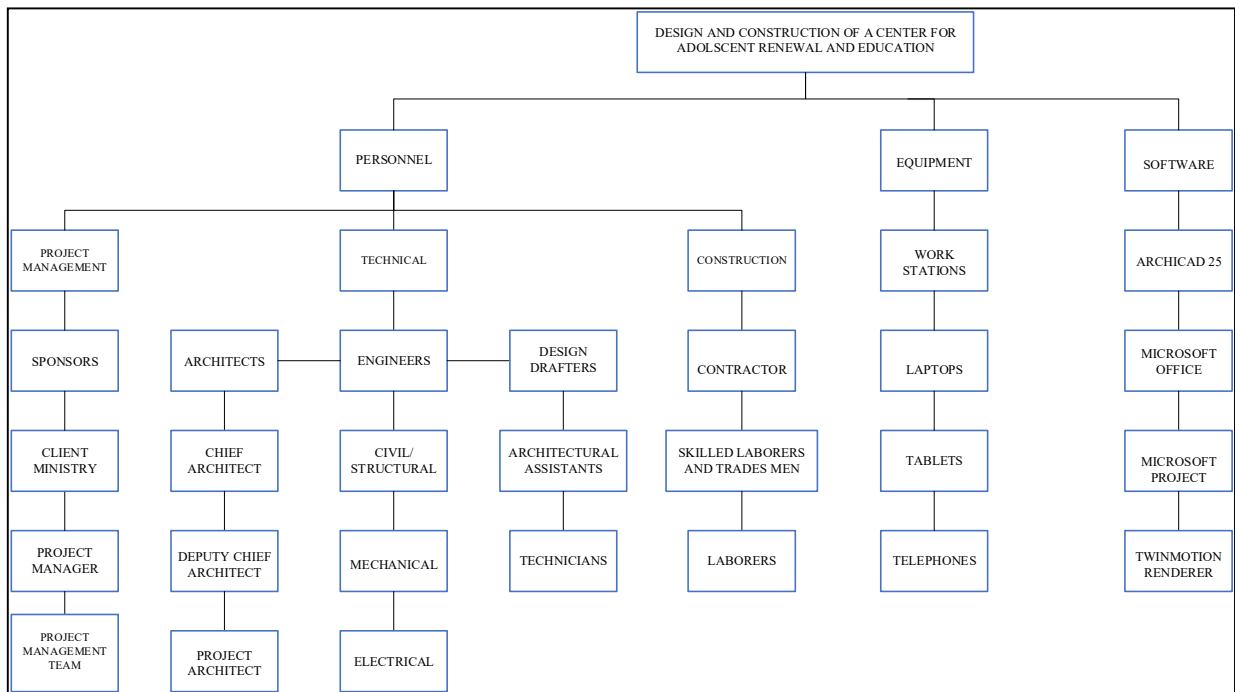
Project resource management is a key component of the project management practice to ensure a successful implementation and completion of the project. Project resources must be managed for adequate utilization and the assurance that the project's elements and processes are put to the best use. This chapter targets the development of a Resource Management Plan for the design and construction of the Center for Adolescent Renewal and Education through the practical application of Project Resource Management. Effective management of resources from the design stage to final commissioning of the built structure is highly dependent on sound application of resource management processes for this project.

4.6.2 Resource Breakdown Structure

Resource Breakdown Structure is a hierarchical representation of resources by category and type (PMBOK®Guide, 7th edition, 2021).

The Resource breakdown structure depicted below in Chart No. 27 demonstrates necessary resources for the tasks that needs to be undertaken for the design and construction for the Center for Adolescent Renewal and Education (C.A.R.E).

Chart No. 27 Resource Breakdown structure (Source: Georges, L.B., Author, June 2023)



4.6.3 Project Resources Management Processes

The resource subject group includes processes needed for identifying and acquiring appropriate project resources such as facilities, materials, people, infrastructure, tools, and equipment useful to realization of project activities.

As stated in (PMBOK®Guide, 6th edition, 2017) the Project Resource Management processes are defined as:

- Plan Resource Management
- Estimate Activity Resources
- Acquire Resources
- Develop Team
- Manage Team
- Control Resources

4.6.4 Plan Resource Management

Resource planning and management is integral to project management success. Plan resource management is the process of defining how to estimate, acquire, manage, and use team and physical resources (PMBOK®Guide, 6th edition, 2017).

Resources are critical to enhancing and guiding efficiency and quality for the design and construction of the Center for Adolescent Renewal and Education.

This planning process establishes the procedures used to manage and recruit resources, in addition to the strategies and processes utilized in identifying and acquiring other essential resources. The project manager has the pivotal role for this process throughout the project's life cycle and ensures that resources are available for the successful completion of the project.

In the planning phase of this project a steering committee was established to provide oversight and support for assurance of achieving project goals. Steering committee meetings were held every fifteen to twenty days, to report on the status of works, and obtain feedback from committee members. The chief architect or project manager guided the design and implementation processes and established a project team led by a project architect to manage the project and provide weekly status reports on project activities. The project architect and project team developed the design concept, schematic and construction drawings, task list, resource plan, communication plan, budget, initial schedule for the project, and established the roles and responsibilities of the project team members inclusive of identifying other key stakeholders needing to form part of the committee as the project matured. The project manager and senior architect worked closely together to create the umbrella structure to guide the project from initial designs to final construction.

The inputs necessary to realize this process are Project Management Plan, project documents, enterprise environmental factors, and some organizational process assets, while the tools and techniques included meetings, interviews, e-

mails, social media apps, expert judgement, and training and development. These were key drivers guiding the project through its planning process and working collaboratively to facilitate the accomplishment of the project’s objectives.

Chart No. 28 below illustrates the document that records team values, agreements, and operating guidelines inter alia, for the Design and Construction of the Center for Adolescent Renewal and Education.

Chart No. 28 Team Charter Template(Source: Team Charter Template | FREE

Download <https://www.stakeholdermap.com/project-templates/team-charter-template.html#template>

TEAM CHARTER

Project name: Design and Construction of the Center for Adolescent Renewal and Education
Project reference: 2031
Date prepared: Chief Architect-Lyndon Barry Georges
Version no: TCA-01

Team members	
Name	Job title or role
Government of India	Project Sponsor
L B Georges	Project Manager / Chief Architect
H Regis	Civil / Structural Engineer
F Eudovique	Project Architect
S Medard	Architectural Assistant
C Pierre, N Constantine	Developer

S King-Hippolyte	Quantity Surveyor
------------------	-------------------

Team values and principles

ID	Value or principle
1	Information is always worth sharing. Always request assistance when needed.
2	For each problem we will bring a solution.
3	Teamwork generates positive solutions. We work as one and aim for success.
4	We are always open and honest.
5	Hard work, and togetherness for a balanced life.

Meeting Guidelines

ID	Guideline
1	If unable to attend a meeting, please propose an alternative time. Prioritization of project team meetings.
2	Be present and active in meetings.
3	confirm whether or not you are able to complete a task on time.
4	Timely arrival at all meetings.

Communication guidelines

ID	Guideline
1	Prioritization of phone calls but always follow up with an email.
2	Confirmation of actions and decisions in writing.
3	Communicate early and often.
4	Work SMART

Decision -making process.

- Team members are free to make decisions about the best way to complete their work, but anything that impacts project scope, time or cost must have prior approval from the project manager.
- The project manager will make decisions on scope within the project tolerance (permitted (approved deviation from planned parameters) and escalate to the project sponsor as needed.

Note. Team Charter Template for providing guidance for how the team will make decisions, conduct meetings, and resolve conflicts. From Microsoft Project Plan templates, (<https://www.stakeholdermap.com/project-templates/team-charter-template.html#template>) Copyright 2008-2080 T Morphy. stakeholdermap.com. All rights reserved.

Chart No. 29 below illustrates the project stakeholders and their responsibility or involvement level in the project.

Chart No. 29 Responsibility Assessment Matrix- R A C I Chart (Source: Georges, L.B., Author, June 2023)

R A C I CHART	INDIVIDUAL / AUTHORITY	Permanent Secretary	Chief Architect/ Project Manager	Project Engineer	Project Architect	Project Design Team	Project Consultants	Contractor
ACTIVITY								
Feasibility Studies, Research and Information gathering.		A	A/R	C	R	R	I	I
Architectural Design and Consultancy		A	A/R	C	R	R	C	I
Stakeholder engagement and management		A	A/R	C	R	R	I	I
Change Requests		A	A/R	R	R	R	C	I
Site Management		A	A/R	R	R	I	C	R
Road Construction		A	A/R	C	I	I	I	R

R A C I CHART	INDIVIDUAL / AUTHORITY	Permanent Secretary	Chief Architect/ Project Manager	Project Engineer	Project Architect	Project Design Team	Project Consultants	Contractor
Building Construction, Landscaping, and exterior works.		A	A/R	C	I	I	I	R
Project Monitoring and Oversight		A	A/R	C	R	I	R	R
Inspection, Testing and Certification		A	A/R	C	I	I	R	I

Key

- R** Responsible Human Resource who performs work
- A** Accountable Human Resource who is ultimately Accountable
- C** Consulted Human Resource that needs to provide feedback and contribute.
- I** Informed Human Resource that needs to know of the decision or Action.

4.6.5 Estimate Activity Resources

Estimating resources was realized to determine the resources needed for each activity. In order to complete project activities, tasks are realized, through the use of plant (tools), equipment and material. Estimating activity resources is the process of estimating team resources and the type and quantities of materials, equipment, and supplies necessary to perform project work. Once activities are

sequenced, quantity and type of resources are determined (PMBOK®Guide, 6th edition, 2017).

For the purpose of this project efficiency of equipment, supplies and human resources are well managed to achieve maximum output. Activity schedules and change request control mechanisms were established to track project progress and manage information output to stakeholders. Internal group meetings for revision and feedback on deliverables were conducted on a weekly basis, allowing for completion of tasks, consideration of risks associated with each planned activity, and risk impact on the overall project.

The inputs necessary to realize this process are the resource management plan scope and scope baseline, activity list and cost estimates. Tools and techniques used were expert judgement, data analysis, meetings, interviews, and e-mails.

Chart No. 30 below depicts a summary of the resource allocation aligned with the proposed schedule per project deliverable.

Chart No. 30 General Resource Calendar (Source: Georges, L.B., Author, June 2023)

WBS Code	Task Name	Duration	Start	Finish	Human Resource
1.1	Project Management	17	May 10, 2021	May 28, 2021	Chief Architect, Project Architect
1.16	Hardware	60	May 10, 2021	June 1, 2021	Chief Architect, Permanent Secretary
1.2	Project Initiation	28	June 1, 2021	July 5, 2021	Chief Architect, Project Architect
1.3	Architectural Design and consultancy	284	July 6, 2021	Sept. 6, 2022	Chief Architect, Project Design Team, Project Architect, Quantity Surveyor
1.3.6	Building Permits (Application)	65	Dec. 22, 2021	March 10, 2022	Project Architect, Project Design Team
1.4	Tendering (Procurement)	91	March 11, 2022	July 13, 2022	Chief Architect, Quantity Surveyor, Central Procurement Division, Tender Evaluation Team, Project Architect.
1.4.6	Contracting	21	July 4, 2022	Aug. 9, 2022	Chief Architect, Legal Officer, Permanent Secretary,

WBS Code	Task Name	Duration	Start	Finish	Human Resource
1.5.2	Road Construction	12	Aug. 3, 2022	Aug. 17, 2022	Civil/Structural Engineer, General Contractor,
1.5	Building Construction Landscaping and Exterior Works	368	Aug. 5, 2022	Oct. 23, 2023	General Contractor, Clerk of Works, Site Supervisor, Site Excavation Contractor, Concrete Contractor, Electrical Contractor, Plumbing Contractor, Civil/Structural Engineer, Landscape Contractor, Mechanical Consultant.
1.5-1.8	Project Monitoring and Oversight	368	July 14, 2022	Oct. 23 2023	Clerk of Works, Site Supervisor, Project Management Team, Project Architect, Chief Architect.
1.6	Inspection Testing and Certification	6	Oct. 27 2023	Nov 3, 2023	Chief Architect, Project Manager, Quantity Surveyor, Electrical Consultant, Plumbing Consultant, Fire Inspector
1.7	Commissioning and Project Closure.	10	Nov 6, 2023	Nov 22, 2023	Chief Architect, Project Manager, General Contractor, Clerk of Works, Electrical Consultant, Plumbing Consultant.

4.6.6 Acquire Resources

In theory, this process entails the locating and purchasing of human and capital resources to execute project-related tasks. (PMBOK®Guide, 6th edition, 2017), defines acquire resources as the process of obtaining team members, facilities, equipment, materials, supplies and other resources necessary to complete project work.

These resources can include anything from skilled personnel to buildings; project gear and other miscellaneous supplies that may be necessary to produce the expected deliverable. The process of obtaining resources may happen on a needs-be basis or on a pre-arranged frequency, i.e., quarterly, monthly, etc. The human and capital resources that may require purchasing can either be obtained from the organization itself (internal) or from other vendors (external). Due to contracts and other project-related documentation, the project manager/team may (or may not) be able to purchase their own equipment and supplies in a timely manner. This control (or lack of) may have direct implications on the delivery of the project's final outcome.

The 'acquire resources' therefore for the design and construction of the Center for Adolescent Renewal and Education will focus on the human resource (the institutional nature allows for in house skilled resources). The project manager will identify from the team of professionals within the division, the technical staff to form part of the design team and further identify the project management team to see the project through its implementation and final

completion process. A project team assignment register is created listing the team members for the design and construction stages. The specialist consultants will be contracted to work with the internal design team throughout the project.

The inputs used in this process are Resource Management Plan, project documents, enterprise environmental factors, and organizational process assets. Tools and techniques used are virtual teams, pre-assigned work, and negotiation.

Chart No. 31 below depicts assigned responsibilities for Project Team members.

Chart No. 31 Project Team Assignment (Source: Georges, L.B., Author, June 2023)

Team member	Role	Responsibility
Permanent Secretary	Administrative Head	<ul style="list-style-type: none"> • Receives project status reports and forwards signed copy to stakeholder agency. • Responsible for overall accountability and approval of financial interventions for the project.
Chief Architect/ Project Manager	Project Manager and Lead Designer	<ul style="list-style-type: none"> • Reviews change requests put forward and manages the scope of the project. • Has overall responsibility for the management of scope. • Updates project documents following scope change requests

Team member	Role	Responsibility
		<p>and communicates scope changes to all stakeholders of the project.</p> <ul style="list-style-type: none"> Keeps a record of all change requests made during the project's life cycle.
Senior Engineer	Lead Project Engineer	<ul style="list-style-type: none"> Prepares all engineering designs for the project. Oversees and guides development of engineering drawings. Assures that engineering resources are available as per standards for incorporation into the project.
Project Architect	Lead Design Developer and Design Team Manager.	<ul style="list-style-type: none"> Responsible for conceptual design development and management of the works design team. Responsible for updating chief architect periodically on progress of works.
Architectural Assistant	Lead Design Assistant	<ul style="list-style-type: none"> Assist project architect in the design development and design review process. Provides general oversight of works realized by architectural technicians.
Architectural Technicians	Drafting Technicians	<ul style="list-style-type: none"> Drafting in conjunction with architect's assistant all construction drawings for application of building permits.

Team member	Role	Responsibility
Electrical Consultant	Lead Electrical Design Implementation Consultant	<ul style="list-style-type: none"> • Receives design layouts from project architect and uses external resources to design and develop electrical engineering layouts and lighting plans as per contractual agreement. • Supervises all electrical installation during the implementation / construction phase and provides formal certifications report etc. when completed.
Mechanical and Plumbing Consultant	Lead Mechanical & Plumbing Design and Implementation Consultant	<ul style="list-style-type: none"> • Receives design layouts from project architect and uses external resources to design and develop mechanical and plumbing engineering layouts and plumbing or mechanical plans as per contractual agreement. • Supervises all mechanical and plumbing installation during the implementation or construction phase and provides formal certifications report etc. when completed.

4.6.7 Develop Team

Develop team is the process of improving competencies, team member interaction, and the overall team environment to enhance project performance (PMBOK®Guide, 6th edition, 2017).

The project strategy focuses on the team being in a project support environment, where their expertise in construction management is used to conduct revision of conceptual and schematic designs for assurance of regulatory compliance.

The project manager is responsible for work assignments, approvals, and change requests. Team development requires that the project manager effectively manages conflicts, motivates, and negotiates with team members for improved functionality and self-reliance. Team reward systems must align to motivational factors that influence individual team members. Once value is felt and appreciated, team members will be motivated to excel. A highly functioning team will not only have a sense of purpose but a sense of belonging. This is extended to the special arrangement of how the team will interact, where they will meet, where information will be processed and where they can locate other team members. Keeping in mind the team members' geographic location, the collocation of the group will be determined. An online team environment will be established to incorporate more skilled resources, improve sharing and filing of documents, track due dates, etc. Using communication technology, anchor teams will be established to keep members

informed of developments for their assigned responsibilities. Video conferencing has improved greatly in the wake of the Covid -19 pandemic, and its use will continue moving forward.

The inputs necessary for the develop team process are Resource Management Plan, Lessons Learned Register, Project Schedule, project team assignments, resource calendars, Team Charter, enterprise environmental factors and organizational process assets. Tools and techniques included colocation, communication technology, interpersonal and team skills, recognition and rewards, training, individual and team assessments and meetings.

4.6.8 Manage Team

Managing team is the process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance (PMI, PMBOK®Guide, 6th edition, 2017). This process guides behavior, manages conflict and resolves issues while addressing management functions associated with recognition, communication, and team objectives, etc. In order to manage the project team, the project manager will develop a variety of management and leadership skills and unite the team effort to produce high-performance teams. Upon commencing the design and construction of the Center for Adolescent Renewal and Education, the project manager will communicate with the project team members on project plans

objectives, expectations, work plan, schedules, etc. of work to be performed.

The project manager is also responsible for performance management (evaluation) of individual team members to assess the level of effectiveness and efficiency periodically and to provide feedback. Staff recognition will be manifested through staff recognition sessions on a yearly basis or biannually.

Documents utilized as inputs for the management of the team in the C.A.R.E project include the resource management plan detailing the human resource needed for the project, project documents including the issue log to record issues that arise during the life of the project, Lessons Learned Register and the project team assignments that detailed the different activities, work performance reports, team performance assessments, enterprise environmental factors and the organizational process assets.

The tools and techniques used in this process are interpersonal and team skills namely conflict management, decision-making, emotional intelligence, influencing, leadership, and project management information system. General reminders are constantly given to ensure that these are being adhered to, and for their adoption if they are not yet in use. This provides clarity and creates a conducive environment thus reducing negative conflicts. Conflict resolution is usually through collaboration or problem solving where a win-win situation is ideal. At other times, depending on the situation, compromise and smooth accommodation will be used. In decision making the chief architect keeps the

team focused towards achieving the project goal by consulting with the project team and conducting democratic decision making such as voting.

4.6.9 Control Resources

Control resources is the process of ensuring that physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual utilization of resources and taking corrective action as necessary (PMBOK®Guide, 6th edition, 2017).


The resource control process group forms an integral part of all previous processes associated with resource management for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E). Resource control is performed throughout the project and is concerned with guaranteeing that the resources required for a project are readily available, timely and as planned for ensuring that project implementation is executed as scheduled. The project manager will measure planned and actual resource utilization, compare them, and ensure compliance with the planned resource utilization process, in order to keep the project successful. Where shortfalls arise (especially for human resources), the project manager will ensure that staff are hired to achieve the deliverable objectives for a successful outcome of the project.

The inputs to the resource control group for this project are Resource Management Plan, project documents, work performance data, supply

agreements, organizational process assets. The tools and techniques used are performance reviews and analysis, problem solving, interpersonal and team skills and project management information systems (electronic tracking of data).

4.6.10 Resource Management Plan Approval

The signatures of the people below indicate an understanding in the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.7 PROJECT COMMUNICATION MANAGEMENT

Communication Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

4.7.1 Introduction

Communication is a two-way process that is healthy and beneficial to all organizations. Communication is critical to projects, especially by using efficient methods that bring about developments with minimal obstacles. During the life cycle of a project, there are various mechanisms for conveying information to stakeholders, contractors, and other project team members. When referring to construction projects it refers to the art of controlling, monitoring, verifying, recording, and documenting of information to strengthen and reinforce relationships in the construction project. It is also fundamental to team management. As indicated in the resource PMBOK®Guide, 7th edition (2021) the Communication Management Plan is a component of the project, program, or portfolio management plan that describes how, when, and by whom information about the project will be administered and disseminated.

As per PMBOK®Guide: A guide to Project Management Book of Knowledge (2017) the Project Communications Management processes are defined as:

- Plan Communications Management
- Manage Communications
- Monitor Communications

The Roles and responsibilities for controlling Project communication is depicted below in Chart No.32

4.7.2 Roles and Responsibilities

Chart No. 32 Roles and Responsibilities

Roles/Name	Responsibilities
Sponsor / Donor Agencies	Communicate Financial information face to face via emails or video conferencing and receive progress reports as required .
Policy Directorate(s)	Responsible for providing feedback from Cabinet of ministers and local community.
Permanent Secretary	Responsible for receiving project status reports, communicating issues management solutions, financials from Donor agency
Chief Architect	Responsible for delivering project briefs, advising steering committee on most appropriate design options and most economical construction method.
Local Community	Responsible for communicating positive or negative impact of project on their livelihood.
Government Agencies	Prime client and Owner of the vocational project Responsible for communicating approval and disbursement of funds for the contractual purposes.
Project Steering committee	Responsible for communicating all issues relating to design, change requests, receipt of project updates.
Project Implementation Unit	Responsible communicating approval of proposed developments and issuing of building permits.
Project Team	Deliver Project Status reports. Issues on site
Contractor / Consultants	Responsible for communicating issues, workflows, possible design changes, procurement issues via email, or face to face.

4.7.3 Plan Communication Management

Plan communication management is the process of developing an appropriate approach and plan for project communication activities based on the information needs of each stake holder or group, available organizational assets, and the needs of the project (A guide to Project Management Book of Knowledge, 2017).

Plan communications management for the design and construction of the Center for Adolescent Renewal and Education required inputs from the Project Management Plan, stakeholder register, organizational process assets, and Enterprise Environmental Factors (EEFs) such as practices, procedures, policies, and legislation, etc. Critical was the development of an effective communication methodology for project communication to satisfy stakeholder needs and requirements during the project's lifecycle. In that regard the project manager will introduce methods for gathering and storing information and establishing efficient and effective distribution structures. A formal Communication Matrix, for assisting in setting expectations for the communication points taking place during project processes and milestones will inform the management of communications for the project. E-mails, text messages, site meetings, phone calls, written invoices, were communication methods used as part of the project.

Chart No. 33 below depicts the summary of the communications plan for the project.

Chart No. 33 Communication Matrix (Source: Georges, L.B., Author, June 2023)

Communication Matrix					
Project Name	Design and Construction of the Center for Adolescent Renewal and Education			Revision Date:	
Project Number	2031		Document Number	CM-ASEC-001	
Chief Architect / Project Manager	Project Architect		Lead Assistant	Technicians (Name Initials)	
Lyndon B Georges	xx		xx	xx	xx xx xx xx xx

Audience	Communicator	Content	Deliverable	Medium	Frequency
Policy Directorate(s)	Project manager	Project progress Issues management Solutions National impact Financials	Project briefs Summary reports Conclusions Recommendations	Face to Face	Monthly or quarterly
Sponsor / Donor Agencies	Project architect / Project manager	Project progress Issues management National impact	Progress reports Budgetary information Project schedule Management plans	Face to Face Video conferencing	As required
Permanent Secretary/ Chief Architect	Project manager	Project progress Issues management Financials Change requests	Project briefs Project reports Request for Information (RFI),	Face to Face	Monthly
Local Community	Contracted media agency Chief architect Project architect	Project progress and benefits	Local culture Information Project progress Impacts Solutions	Face to Face	Monthly

Audience	Communicator	Content	Deliverable	Medium	Frequency
Government Agencies	Chief architect Project architect	Project progress National impact Avenues for collaboration	Project brief Summary schedule Budgetary summary report Project Charter	E-mails Video conferencing Face to face	Quarterly
Project Steering committee	Chief architect Project architect	Project progress Issues management Financials	Summary reports Updated schedules. Budget forecasts	Video conferencing Face to face	Monthly
Project Implementation Unit	Chief architect Project sponsor Project manager	Project Progress Issues	Progress reports Progress meetings	Face to face emails	Bi-weekly
Project Team	Project manager	Project progress Issues management Team development	Progress reports Issues Solutions	Face to Face E-mails	Weekly
Contractor / Consultants	Project manager Project architect	Project information Issues Profiles	Correspondence Meeting minutes	Face to face E-mail	As required

4.7.4 Manage Communications

Manage communications is the process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of the project information (PMBOK® Guide, 2017).

Good relationships are key to the success of any project operation and an effectively managed communication strategy builds trust and promotes transparency between stakeholders and other project team members. Manage communications for

the design and construction of the Center for Adolescent Renewal and Education will identify with all the agreed communications methods aligned to the planned communication process. The project manager will ensure that the work activities and processes allow for flexibility and adjustments in techniques to meet changing needs of stakeholders and project implementation parties. The project manager will use the communication matrix as the principal tool to manage communications for the project and ensure that all key personnel are kept informed as scheduled.

In the event of issues arising as a result of project communication, it becomes necessary to escalate the issues, if the resolution is above the authoritative level of the receiver. The project team will maintain an issue log to record all issues arising during the lifecycle of the project. The issues log will be managed by the project manager and his assigned project team. Customary will be the assignment of experienced personnel managed by the project manager to ensure the continuation of the project despite disruptions and ongoing resolutions.

N.B.

Any issues not needing escalation will be handled at the project supervisory level where it will be addressed by the project architect and any other assistant approved to work along with him.

Chart No. 34 below depicts the matrix for managing communications throughout the project.

Chart No. 34 Issues-Log / Communications Escalation Matrix (Source: Georges, L.B., Author, June 2023)

Issues-Log / Communications Escalation Template					
Project Name	Design and Construction of the Center for Adolescent Renewal and Education			Revision Date:	
Project Number	2031			Document Number	DCL-ASEC-001
Chief Architect / Project Manager		Project Architect		Lead Assistant	
Lyndon B Georges		xx		xx	

Issue No.	Issue Details	Raised by	Date raised	Assigned to	Priority			Comments	Escalate		If “yes” to escalated, select to whom			Status	Closure date
					H	M	L		Y	N	P M	PS	PSC		

Key

Priority

H= High : Resolve Within Two Weeks ; M= Medium : Resolve Within Three Weeks ; L= Low : Resolve within one month

Escalate:

Y=Yes ; N= No

Escalated to

PM= Project Manager ; PS= Permanent Secretary ; PSC= Project Steering Committee.


4.7.5 Monitor Communications

Monitor communications is the process of ensuring the information needs of the project and its stakeholders are met (PMBOK®Guide: A guide to Project Management Book of Knowledge, 2017).

The objective of monitor communication is ensuring the optimal flow of information using the agreed communication mediums, among all communication participants at the correct time or within the agreed time frame. The monitor communications process for the project is the primary responsibility of the project manager who ensures that all stakeholders and other project personnel are kept informed via the established medium(s). The project manager through this process will ensure that messages and content are directed to the correct receiver at all times. The monitoring communications process may reveal the need to amend aspects of the Communications Management Plan and strategy to better satisfy the needs of the intended audience by changing the communication channels or the frequency of the information as deemed necessary by the project manager.

4.7.6 Communications Management Plan Approval

The signatures of the people below indicate an understanding in the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.8 PROJECT RISK MANAGEMENT

Risk Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

4.8.1 Introduction

Risk analysis and management is a fundamental project management practice that assists in controlling risk occurrence on the project. In anticipation of risk occurrence, a streamlined risk management process will be applied to predict the uncertainties in the project and minimize the occurrence or impact of these uncertainties. This will improve the chance of project success and reduce the consequences of those risks.

PMBOK®Guide: A guide to Project Management Book of Knowledge (2017), defines risk management as the process of conducting risk management planning, identifying, analyzing, response planning, response implementing, and monitoring risk on a project.

According to PMBOK®Guide: A guide to Project Management Book of Knowledge (2017) the Project Risk Management processes are defined as:

- Plan Risk Management
- Identify Risks
- Perform Qualitative Risk Analysis
- Perform Quantitative Risk Analysis
- Plan Risk Responses
- Implement Risk Responses
- Monitor Risks

4.8.2 Plan Risk Management

Plan risk management is the process of determining how risk will be managed throughout the project life cycle of the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E) Project. This is an ambitious project that deals with diverse risks associated with its urban environment and also geographical location in Saint Lucia. The project manager will identify all risks and evaluate their consequences on the successful execution of the project. The tools provided by the project management book of Knowledge (PMBOK), allowed for the establishment of risk monitoring and response priorities and procedures to proactively prepare for risks when they occur.

The purpose of this process is to create a framework within which risks can be identified and strategies developed to accept, mitigate, transfer, or avoid potential risks. The project manager working with the project team will create the risk management plan in the planning phase, nevertheless it will be monitored and updated throughout the life cycle of the project. As inputs to the project the Project Charter, procurement documents, stakeholder register, activity cost, activity durations, organizational process assets and enterprise environmental factors were consulted. Expert judgement and meetings are the tools utilized during the plan risk management process. The plan aims to eliminate any negative impacts to the project while maximizing favorable opportunities which may exist.

4.8.2.1 Risk Breakdown Structure (RBS)

This risk breakdown structure will be used to structure and guide the risk management process through the understanding of the distribution of risk on the project and aiding in effective risk management.

The Risk Break down Structure for controlling detecting and controlling risk is depicted below in Chart No.35

Chart No. 35 Risk Break Down Structure (Source: Georges, L.B., Author, June 2023)

Risk Breakdown Structure					
Project Name	Design and Construction of the Center for Adolescent Renewal and Education		Date:		
Project Number	2031		Document Number	RC-ASEC-001	
Chief Architect / Project Manager	Project Architect	Lead Assistant		Technicians (Name Initials)	
Lyndon B Georges	xx	xx		xx	xx xx xx xx xx

Risk-Level 0	Risk-Level 1	Risk-Level 2	Risk-Level 3
Project Risk	External (RExt)	Natural Environment	Unexpected flooding due to heavy prolonged rain.
			Possible occurrence of Hurricanes and troughs
			Fire due to close proximity to crude oil storage facility.
			Occurrence of mild to low seismic activity.
		Economic	Labour Market
			Labour conditions
	Industry (RInd)	Market	Change in demand
			Availability of raw materials
	Environment (REnv)	Statutory	Planning approval delay
			Legislation changes
			Ecological Constraints, Environmental impact assessments etc.
	Client	Client team	Client representative fails to perform duties

Risk-Level 0	Risk-Level 1	Risk-Level 2	Risk-Level 3
Project Risk	(Rcli)		No single point of contact
			Client team responsibilities ill-defined
		Project Management (PM) team	2.6.1-Inadequate project management controls
			2.6.2-Incorrect balance of resources & expertise
			PM team responsibilities ill-defined
		Targets	Project objectives ill-defined
			Project objectives changed mid-design
			Conflict between primary & secondary objectives
		Funding	Late requirement for cost savings.
			Inadequate project funding.
			Funds availability does not meet cash flow forecasts.
			Untimely payments for completion of work phases.
		Tactics	Poor team communication.
			Unstructured changes in core team.
			Inadequate number of staff.
			Inability to comply with design sign-off dates.
	Change control procedure not adhered to or accepted.		
	Project (RPro)	Team	Poor team communication.
			Changes in core team
			Inadequate number of staff
			Individual roles and responsibilities not clearly defined.
		Tactics (2.1)	Cost control ...
			Time control ...
			Quality control ...
Change control ...			
Tasks (2.12)		Site...	
		Design...	

4.8.2.2 Probability And Impact Scales

For proper project management, risks must be quantified and qualified. The Project Management book of knowledge (PMBOK) establishes the Qualitative Risk Analysis and Quantitative Risk Analysis processes to establish the probability of a risk occurring and establish in case it occurs what would be the real impact to the project. This analysis provides the project manager with the tool to establish prioritized risk monitoring and responses. The impact scale seeks to give a numerical value to the risk occurring that would affect project constraints like schedule, cost, scope, and quality. It is referenced in a scale from a Very Low impact (easily ignored) to a Very High impact (with very important costs taking the toll).

The following Chart No. 36 below is depicting the scale to measure impact of risks for on C.A.R.E project.

Chart No. 36 Impact Scale

Impact scale	Description	Number
Very low (VL)	Impact may be safely ignored	0.05
Low (L)	Impact minor with routine management procedures	0.20
Medium (M)	Large impact, but can be managed with effort using standard procedure	0.40
High (H)	Critical event, potential for major costs, or delays	0.60
Very high (VH)	Extreme event, potential for large, financed costs or delays or damage to the project organization's reputation	0.85

On the other hand, all risks have a probability of occurring. The project manager and the project team's experience will allow a Probability Scale to be generated and give the identified risks a value according to the created table. For the CARE project, the team has established the following probability scale to qualify the identified risks from a Very Low probability to a Very High probability of occurring.

The following Chart No. 37 below depicts the scale to measure probability of occurrence of risks for the C.A.R.E project.

Chart No. 37 Probability Scale

Probability scale	Description	Number
Very low (VL)	Possible, but very unlikely	0.05
Low (L)	Possible, but unlikely	0.15
Slightly low (SL)	Possible, but slightly unlikely	0.3
Medium (M)	Possible, and likely	0.5
Slightly high (SH)	Likely	0.7
High (H)	Highly likely	0.85
Very high (VH)	Very highly likely	0.95

4.8.2.3 Probability and Impact matrix

The probability and impact matrix is a part of the qualitative analysis in risk management. The matrix is a grid used to map the probability of each risk occurrence and its impact on the project's objective if the risk occurs

(PMBOK®Guide, 6th edition, 2017). This matrix is created for the C.A.R.E project construction and it provides the ratings which allows for prioritizing risks into priority groups. The matrix uses the Priority scale ratings from Table 3 and the Impact scale ratings from Table 2. The probability and impact matrix is calculated by multiplying the ratings from the two tables above to provide the numeric rating shown in Table 4. Numeric calculations ratings range from 0.00 to 0.95 where by 0.00 is low probability and low threat or opportunity. The matrix also allows for risk to be categorized as a threat or opportunity and to determine where on the matrix such risk falls under each category. This allows the team to prioritize and strategize on how to resolve the risk.

The color provided in the Probability and impact matrix reference identifies the impact and probability of the risk to occur to the project. Numerical calculation results that are colored green generally means the risk does not impact the project significantly and can be ignored. Numerical calculations results that are colored yellow generally mean the probability is medium to high, but the threat or opportunity is low meaning the management of the risk would require some routine management procedure. Numerical calculations resulting in red are considered to have a high probability of occurrence and threats and opportunities are medium to very high. This generally means these risks will require intervention or can delay the project schedule, cost, or scope. These risks will then be the priority risk to alleviate and for which planning solutions will have to be developed from the onset.

The risk register will detail the risk identified by the team, along with the priority and impact obtained from charts 35 and 36 above, then calculate the

probability and impact using Chart No. 37 to identify where the risk falls within the table and the team can then prioritize the risk and plan accordingly for the C.A.R.E project.

Chart No. 38 below depicts the matrix used to map the probability of occurrence for risks and its impact for the project.

Chart No. 38 Probability and Impact Scale (P x I)

	THREATS					OPPORTUNITIES				
Probability scale	VL (0.05)	L (0.20)	M (0.40)	H (0.60)	VH (0.85)	VH (0.85)	H (0.60)	M (0.40)	L (0.20)	VL (0.05)
VH (0.95)	0.05	0.19	0.38	0.57	0.81	0.81	0.57	0.38	0.19	0.05
H (0.85)	0.04	0.17	0.34	0.51	0.72	0.72	0.51	0.34	0.17	0.04
SH (0.70)	0.04	0.14	0.28	0.42	0.60	0.60	0.42	0.28	0.14	0.04
M (0.50)	0.03	0.10	0.20	0.30	0.43	0.43	0.30	0.20	0.10	0.03
SL (0.30)	0.02	0.06	0.12	0.18	0.26	0.26	0.18	0.12	0.06	0.02
L (0.15)	0.01	0.03	0.06	0.09	0.13	0.13	0.09	0.06	0.03	0.01
VL (0.05)	0.00	0.01	0.02	0.03	0.04	0.04	0.03	0.02	0.01	0.00

4.8.3 Identify Risks

Identify Risk is the process of identifying individual project risks as well as sources of overall risk and documenting their characteristics (PMBOK®Guide: A guide to Project Management Book of Knowledge (2017)).

This process was a collaborative effort between the chief architect and the project architect. During this process, historical, environmental, and zonal studies were conducted to obtain information on trends and impacts of natural phenomena within the respective zone. This process was conducted during the initiating and planning stages of the project and information obtained was used to develop the risk register for the project. The identify risk process is iterative in nature and it is required throughout the project as new risk can emanate at any stage during the project's life cycle. For the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E) project, the project team has identified risk under the following risk categories which are further broken down in the risk breakdown structure in chart No .08.

- Industry
- Environment
- Design
- Construction
- Financial
- Clientele

4.8.4 Qualitative Risk Analysis

The qualitative risk analysis is the process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics (PMBOK®Guide: A guide to Project Management Book of Knowledge (2017). Realization of this activity for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E)

was conducted by the project team lead by the project manager through a process of assessing risk prioritization using probability of occurrence. With input from other stakeholders and steering committee members, the probability and impact of each risk were evaluated using the probability and impact scales in Charts No 35 and 36. For performing the qualitative risk analysis, the risk register, assumption log, organizational process assets, project documents inter alia were utilized.

The project manager will guide the project team in reviewing, strategizing, and updating documents for project risks and issues throughout the project's life cycle at predetermined or scheduled meetings.

4.8.5 Quantitative Risk Analysis

Perform quantitative risk analysis is the process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives (PMBOK®Guide, 6th edition, 2017).

This process requires the quantitative analysis for risk exposure and risk analysis and is an objective analysis based on verified data or evidence to support the type of risk response which is needed to plan risk for the C.A.R.E project. For the purpose of this project, perform quantitative risk analysis was not utilized due to the fact that this is a simple project being realized on a small scale; hence the qualitative analysis will suffice for the level of risk identification, mitigation inter alia needed to plan and categorize risks as they emanate. This is also a phase one of a three to four phase project. It is possible that for the other phases, especially if funding is available for realization of all pending phases, the probability exists that a quantitative risk analysis would be necessary at that point.

4.8.6 Risk Register

The risk register provides details for each individual risk, previously identified, and prioritized, which requires risk responses. The prioritization of each risk will assist in the selection of risk responses. High-priority threats or opportunities may require greater importance, action, and proactive measures. On the other hand, threats and opportunities in the low-priority level may not require the same actions as in the high-priority other than being reflected in the risk register; watch list or adding contingency reserve (PMBOK®Guide, 6th edition, 2017).

The following risk register provides a detailed description (RBS Code, Cause, Risk, Consequence, Probability, Impact, P x I, Trigger, Owner,) of each risk identified for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E).

As part of the Risk Response Plan the Risk Register has been updated to include the Risk reference, Risk Response, Preventive Actions, Trigger and Risk Owner. Establishing the appropriate plan will allow the C.A.R.E project to be delivered successfully.

The following Chart No. 39 below depicts the register for identification and prioritization of risks for the project.

Chart No. 39 Risk Register (Source: Georges, L.B., Author, June 2023)

RBS Code	Cause	Risk Description	Consequence	Reference	Probability (0.1-0.9)	Impact (0.05-0.80)	Rank (P x I) (calculation)	Response	Preventive Actions	Trigger	Owner
Rext 01	If the war between Russia and Ukraine worsens	Higher oil prices	Increase of the import prices of the materials which will increase at retail price and can affect the budgeted amount for the project	Persistence in the war and sanctions being given by other countries in support to Ukraine	0.3	0.4	0.12	Avoid: At the start of the project ensure to procure enough materials for the construction of the project to avoid paying the increased prices of materials due to the persistent war situation between Ukraine and Russia	1. Procure and stock materials during the early stage of the project 2. Make advance payments to the company in terms of the materials needed for the project	Confirmed increase in oil prices and the import prices	Project Procurement Manager
Rext 02	If the construction is not completed before the hurricane season (June to November)	The inclement weather (cyclones, heavy rainfall, and strong winds)	Could cause delays and rework	Schedule coincides with the hurricane season and eminence of inclement weather is observed	0.3	0.6	0.18	Avoid: Ensure that the critical path schedule does not fall within the hurricane season. Start early to avoid the critical path to lead to the hurricane season. Mitigate: If avoidance cannot be achieved prepare a hurricane plan to reduce its risk. This would include planning ahead, paying attention to early warning; get moving in ensuring the protection of the construction. Accept: After all clear, conduct an impact assessment on the damages Delegate Risk: If the site has been completed before the hurricane season, pay hurricane insurance to cover damages caused by the natural disaster	The critical path doesn't fall during the hurricane season. Be prepared with a detailed hurricane plan including all aspects that can cause damage to the construction. If construction is completed-insure the building against hurricanes, fires, floods, etc.)	Confirmed formation of tropical depression with high probability of cyclone formation heading in the direction of the country	Project Construction Manager

RBS Code	Cause	Risk Description	Consequence	Reference	Probability (0.1-0.9)	Impact (0.05-0.80)	Rank (P x I) (calculation)	Response	Preventive Actions	Trigger	Owner
RExt 03	If the building site is not backfilled before the hurricane season	The heavy rains could cause flooding.	Destabilization of the land making it difficult for the construction to start or proceed	Torrential rains during the first three (3) months of the construction process cause flooding that triggered an automatic closure of the site until conditions were favorable for work to continue	0.3	0.6	0.18	Avoid: At an early stage of the project, ensure the procurement of backfill and ensure that the job is executed at an acceptable level.	Procure the backfill soil. Have the workers complete the backfill of the site at the early stage of the project. Build proper drainage	Confirmation of inclement weather heading to St. Lucia	Project Construction Manager
RExt 04	If a pandemic becomes a national emergency	The health and safety protocols and symptoms of the disease could lessen the number of employees on site and require sanitary measures	The construction process will slow down and increase the budget due to added cost to purchase sanitization items	No health issue presented on-site thus far in spite of positive cases on island	0.15	0.5	0.075	Avoid: Sensitize all employees to all issues associated with the Monkey Pox virus and establish an automatic stay at home policy if anyone presents symptoms Mitigate: Purchase specialized equipment and establish an entry screening point with a trained health aid Establish the use of protective sanitary equipment aligned to establish public health protocols for use at all times while on-site. Any suspected cases will not be allowed to enter the construction site	On-site nurse station as point of entry for all workers Relevant temperature readings etc., will be conducted in accordance with established public health protocols and standards to ensure that suspected positive and positive cases do not enter the construction site. This will be done on a daily basis until the state says otherwise	Confirmation of the first monkey pox case in the island with high exposure to the public	Project Manager
RExt 05	If the company is unable to secure labour	Due to the lack of skilled labour in masonry, electricians, plumbers, and carpenters	Then skilled labour will have to be imported from neighboring countries and increase cost of labour	Contractor unable to employ majority local skilled labours	0.7	0.4	0.28	Avoid: Employ as many local skilled labours; offering attractive salary and benefits for employees Mitigate: Begin to import skilled labours from early to ensure shortage of workers will not delay construction and ensure budget contain	30 days delay to obtain skilled workers	Confirmed lack in numbers of skilled local labours	Project construction manager

RBS Code	Cause	Risk Description	Consequence	Reference	Probability (0.1-0.9)	Impact (0.05-0.80)	Rank (P x I) (calculation)	Response	Preventive Actions	Trigger	Owner
								contingency for imported hire			
RInd 01	If materials are not readily available	Due to import affectations and logistic shipping crisis	The construction process will slow down	Materials arriving to country by ship have been delayed up to 3 months	0.3	0.6	0.18	Avoid: Purchase locally and stock up at beginning of project Transfer: Make advance payments to suppliers on a penalty fee agreement Mitigate: Pay additional for airfreight deliveries	Identify multiple providers. Stock up material from beginning of project. Purchase most of material locally and make advanced payments for material reserve	Expected material delivery schedule informed by providers	Project Procurement Manager
REnv 01	If statutory approvals are not completed on time	Due to lack of proper documentation in the proceedings	The startup of the building will be delayed, and final delivery schedule will need to be modified	Government offices have been slow in providing construction permits and environmental approvals	0.15	0.6	0.09	Avoid: Person performing the process must have specific knowledge and have the contacts to provide all the required documentation as specified by government offices Mitigate: Present documentation to government offices with enough anticipation	Establish a comprehensive list of all required documentation. The person in charge must be knowledgeable and experienced with the process. Present all documentation with enough anticipation	Expected approval dates by government offices are not being met	Project Manager
Rpro 01	If the Team uses a stacked building design.	Due to requirements for climate resilience and energy efficiency requirement.	The building can meet client requirements and obtain planning approval in less time ensuring construction begins on time	Architecture and Project team might find a design already available that meets the criteria and is within budget and has been used within the country hence requiring minimal adjustments	0.7	0.2	0.14	Exploit Opportunities: Research and select building design from previously designed buildings that can be minimally modified to fit within requirements. Improving Opportunity: work with donor organization to determine if pre-designed buildings have been used from similar projects that can fit within this project.	1. Ensure there are stock design available for company to review and designs are within the parameters of the project design and requirements.	Confirmed use of stock building design	Project manager

RBS Code	Cause	Risk Description	Consequence	Reference	Probability (0.1-0.9)	Impact (0.05-0.80)	Rank (P x I) (calculation)	Response	Preventive Actions	Trigger	Owner
Rpro 02	If the team selects a contract bid below the grant available.	To optimize on the grant available	Then contract overrun can occur eventually increasing construction cost and going over budget	The board select a bid from a contractor that is below the grant as cost saving measure without fully vetting the budget and company	0.5	0.85	0.425	<p>Avoid: Selecting a bid that budget is vetted and close to the cost of similar project</p> <p>Vet the company or ensure it is an established and reputable company.</p>	<p>Ensure favoritism is not a factor in selecting bids and contracts.</p> <p>Ensure the selecting committee is knowledgeable of selection criteria and is experienced and knowledgeable in the field area</p>	Confirm approval to use a contractor who bid below grant finance	Project manager
Project General Risk: High							0.186				

4.8.7 Plan Risk Responses

Plan Risk Response is the process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as treating individual project risks (PMBOK®Guide: A guide to Project Management Book of Knowledge, 2017).

The project team members managed by the project manager are each assigned a risk or risks and empowered with the responsibility for monitoring that risk for possible occurrence. Risk owners will report any threats risk may pose or any opportunities as a result of non-occurrence of a specific risk. For the realization of this process discussions were held at weekly project team meetings, as scheduled in the Communication Matrix and summary reports presented on individual risk by responsible team members. Risk actions were developed by selecting one of the options: Avoid, Mitigate, Exploit, Transfer, or Accept Risk. Project change requests will be analyzed for their possible impact on the project risks. The risk register will be updated periodically with the appropriate risk response while risks are monitored.

4.8.8 Implement Risk Response

Implement risk response is the process of implementing agreed upon risk response plans (PMBOK®Guide: A guide to Project Management Book of Knowledge, 2017).

Realizing this process for the project guarantees that the risk responses are undertaken as agreed by all project team members. This is advantageous because it creates an avenue for minimized risk exposures and threats and maximizes opportunities. General oversight of this process is the responsibility of the project manager. The inputs required for the 'Implement Risk Responses' are project documents which include the Risk Register, Lessons Learnt Register, Project Management Plans, and organizational process assets. The tools and techniques include expert judgement and interpersonal and team skills.

4.8.9 Monitor Risks

Risk monitoring is the process of monitoring previously identified risks and reinforcing the existing structures and risk response strategies to identify, analyze and plan for newly identified risks. The updated Risk Register will be maintained by the project manager and his project team, and the results will be reported as part of the weekly project status report. Risk monitoring will reassure the effectiveness of the risk management plan. Work performance data, Lessons Learnt Register, and Risk Register and work performance reports are integral to this process while audits and meetings are the tools utilized during this process.


Project activities involved in risk monitoring for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E) include the following:

- Validating risk mitigation and strategies
- Sending regular updates (risk management must be proactive not reactive)

- Updating risk register.
- Identifying new risks resulting from mitigation actions.
- Collaborating with team members openly and honestly to avoid overlooking potential risks.

4.8.10 Risk Management Plan Approval

The signatures of the people below indicate an understanding in the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.9 PROCUREMENT MANAGEMENT PLAN

Procurement Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

4.9.1 Introduction

The Project Procurement Management process for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E) entails the selecting, acquiring, coordinating, and maintaining of commodities and services to achieve the project's objectives via Plan, Conduct, and Control Procurement Management. The project manager is responsible for communicating with vendors to rent, buy, or contract products or services needed to achieve the project's objectives.

PMBOK®Guide 6th edition, 2017, defines procurement management as processes needed to purchase or acquire products, services, or results needed from outside the project's team. It encompasses management and control processes required to develop and administer agreements contracts, purchase orders, memoranda of agreements, or internal service.

Based on information presented in PMBOK®Guide 6th edition, 2017) the Projects' Scope Management processes are defined as:

- Plan Procurement Management
- Conduct Procurements
- Control Procurements

4.9.2 Plan Procurement Management

According to project management literature, the planning process in procurement management entails the recording and documenting of decisions agreed upon for purchasing, Goods and services as well as the method to find and utilize specific vendors. This process can occur on a need-be basis or at predetermined intervals, i.e., quarterly, or monthly, and is integral in determining how the team will obtain human or capital resources needed for the project. It clearly defines the roles and responsibilities of the team members to ensure that it is operated by personnel with the appropriate skillset, as well as providing a checklist of tasks that should be completed prior to commencing the procurement process.

The design and construction of The Center for Adolescent Renewal and Education (C.A.R.E.) is governed by the Public Procurement and Asset Disposal Act, of 2015. Supporting documents (Procurement Guidelines 2014, Procurement User Manual June 1, 2021) are provided as guides for application of the procurement processes. The Act defines the corresponding procurement requirements based on the cost for realizing the project.

The procurement process in Saint Lucia is divided into three approval categories. All three categories follow similar set procedures and processes, but approval level varies.

Chart No. 40 below depicts Procurements Categories for State Projects.

Chart No. 40 Procurement Categories (Source: Public Procurement and Asset Disposal Act, 2015)

Category	Amount	Approval Level
Minor	Up to EC\$100,000.00	Permanent Secretary
Intermediate	Between EC\$100,000.00 and EC\$500,000.00	Departmental Tenders
Major	EC\$500,000.00 and above	Central Tenders Board

The project being used as part of this assignment Design and Construction of the Center for Adolescent Renewal and Education falls within the price range of EC\$ 500,000.00 and above, EC\$ 1,834,357.07 to be exact. Hence it is classified as major category project which must receive approval from the Central Tenders Board.

Normally a second meeting is scheduled for the implementing agency to defend and provide reasonable justification for the selected bidder and obtain final approval or rejection from the Central Procurement Board. If approval is granted, the procurement process moves to the contractual stage and commencement of construction work.

Some of the inputs that the PMBOK recommends and that were used throughout this project include:

- Project Charter
- Business documents

- Project Management Plan
- Project documents such as team assignments, and requirements documents and matrix, and a stakeholder register.
- Enterprise environmental factors, particularly marketplace conditions in St. Lucia.
- Organizational process assets, especially the pre-approved seller lists and contract types.

The tools and techniques utilized were expert judgement, specifically meetings with different experts in the field of construction and high-level government officials in St. Lucia; as well, the collecting and analyzing of data from the project team members on the functions of the C.A.R.E facility to ensure that the requirements of the residents and customers are met.

4.9.3 Conduct Procurement Management

According to PMBOK®Guide (2017, p. 482) conduct procurement is “the process of obtaining seller responses, selecting a seller, and awarding a contract.” The advantage of this process is that it selects the qualified seller and the legal agreement for delivery is implemented. This process concludes with established agreements including formal contracts and can occur periodically throughout the project cycle as required.

The inputs for this process include the project management plan (scope management plan, requirements management plan, communications management plan, risk management plan, procurement management plan, and cost baseline); project documents (lessons learned register, project schedule, requirements documentation, risk register and stakeholder register), procurement documentation, seller proposals, enterprise environmental factors, and organizational process assets.

The conduct procurement process for the design and construction of the Center for Adolescent Renewal and Education was realized during the design phase for procurement of consultancy services and during the construction phase for procurement of works.

The Public Procurement and Asset Disposal Act, of 2015 stipulates the Conduct Procurement Procedures as follows:

- Initiation of public procurement procedure
- Notice of expression of interest
- Prequalification Exercise
- Short listing
- Request for proposals
- Submission of proposal
- Evaluation of technical proposal
- Consideration and evaluation of financial proposal
- Selection of proposal

- Negotiation of proposal
- Request for sealed quotation (Negotiated Proposal)

In the case where prequalification is required, the following conditions will apply for submission:

- Updated Project Portfolio information
- Financial resources
- Key Personnel
- Equipment
- Specialized contractors

4.9.3.1 Description of Procurement Processes

Upon completion of the construction set of drawings, procurement for consultancy services was initiated for Mechanical, Electrical, Plumbing (MEP), Civil/ Structural engineering through a selective bidding process. Terms of Reference (TOR's) were prepared for each discipline and attached to request for proposal packages for collection by shortlisted firms. Simultaneously a request for approval of Procurement Procedure was forwarded to the Ministry of Finance and Ministry of Economic Development to obtain formal approval for procurement for the construction of the project. Due to the nature and urgency of the project approval was granted to shortlist six (6) eligible construction companies to form part of an

open competitive tendering process for the supply of the construction works.

With the receipt of the consultancy drawings and specification the tender packages were compiled for collection.

Package Includes:

- Invitation to tender letter
- Form of Tender
- Terms Of reference
- Request for information
- Request for proposal
- Contractual Agreement
- Statement of works including full set of construction drawings
- Blank bill of quantities

A forty-day workday period is allotted for bidders to peruse documents, conduct market research, and finally populate required sections of package documents for re-submittal on a specified date and time. Tenders were submitted to the central procurement unit as per requirements on invitation to tender letter and a meeting for opening of tenders was scheduled. Opening of tenders took place on the scheduled date and the request for approval of the evaluation team was granted by central procurement. Tender evaluation was conducted for a detailed review of all submitted packages and at the end of the process a qualifying bidder was

selected, and a tender evaluation report was prepared to validate and justify the winning bid. It should be noted that as part of the process any tender arriving after the deadline for submission has expired, would have been received for recording purposes but automatically rejected by central procurement for evaluation due to untimely submission by the bidder (seller).

A second meeting was scheduled for the implementing provide reasonable justification for the selected bidder and obtain final approval or rejection from the Central Procurement Board and if approval is granted, the procurement process moves to the contractual stage and commencement of construction work.

Tools and techniques for this process included expert judgement, advertising, bidder conferences, data analysis (proposal evaluation) and interpersonal and team skills (negotiation. Internal personnel with technical and subject matter expertise in proposal evaluation evaluated the bids. Advertising to seek potential sellers was done via several platforms. Bidder conferences were not held due to the nature of the project. Negotiation skills were used to reach an agreement between the seller (Contractor) and the buyer (Department of Physical Development and Urban Renewal).

4.9.4 Control Procurement Management

Control procurement is concerned with managing and monitoring procurement activities including managing contracts and ensuring that the performance of every party conforms with the agreed upon requirements as per the contract. (PMBOK®Guide, 6th edition, 2017) explains the process as one for managing procurement relationships, monitoring contract performance, making appropriate changes and corrections and closing out contracts. The chief architect or project manager will assume responsibility for the control procurement function for the design and construction of the Center for Adolescent Renewal and Education. He or She will ensure that procurement and procurement processes are in accordance with the Saint Lucia Public Procurement and Asset Disposal Act of 2015(Amendment 2020). The chief architect will oversee the entire project process and ensure that consultants and contractors are operating within the confinements of the procurement framework for the project.

Throughout this process the chief architect and project architect ensure that contract management is effectively administered, and deliverables meet agreed quality standards through the implementation of quality control systems (checklists and standards for implementation). Consultants and the project management team will provide status updates on project activities on a daily basis which will be used to update the project report on a weekly basis or as necessary. Where changes and or corrections are required, the buyer and seller must agree on changes and consequently following agreement amendment (s) is or are prepared and dually signed. Where changes relate


to cost, the buyer will submit to the contractor a request for proposal which when received must go through the established change management process for approval.

4.9.4.1 Closed Procurements

When closing the contract for the project, the chief architect / Project Manager must submit all reports for vetting and sign-off as well as receipts for all inspection certificates and reports. Written notice is received from the contractor of completion of all works. All final accounts are prepared including any outstanding payments to be made to the contractor. The chief architect then sends to the contractor formal completion and closure notices and decommissioning of site as per contractual agreement. This is accomplished through inspection and verifying that all quality requirements meet the established standards. The taking over certificate is issued and the defects liability period commences. The performance certificate is subsequently issued. The project documents are updated accordingly and then the procurement of all the components design and construction of The Center for Adolescent Renewal and Education are closed.

4.9.5 Procurement Management Plan Approval

The signatures of the people below indicate an understanding in the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

4.10 STAKEHOLDER MANAGEMENT PLAN

Stakeholder Management Plan for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.)

4.10.1 Introduction

Stakeholder Management deals with relationships between stakeholders and an organization. Such relationships can positively or negatively impact individuals and processes, hence influencing project success. It is therefore essential to manage stakeholders in an effort to minimize the negative impacts to capitalize on the opportunities of success.

PMBOK®Guide, guide (2017) explains stakeholder management as the process required to identify the people, groups, or organizations that could impact or be impacted by the project; to analyze stakeholder expectations and their impact on the project; and to develop appropriate management strategies for effectively engaging stakeholder in project decisions and execution.

The C.A.R.E. stakeholder management plan will identify an approach to manage stakeholders by establishing their roles and responsibilities and developing management strategies in accordance with PMBOK guidelines.

According to PMBOK®Guide, 6th edition (2017) the Project Stakeholder Management processes are defined as:

- Identify Stakeholders

- Plan Stakeholder Engagement
- Manage Stakeholder Engagement
- Monitor Stakeholder Engagement

4.10.2 Identify Stakeholders

Identify stakeholders is the process of identifying project stakeholders regularly; and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success (PMBOK®Guide, 6th edition, 2017). For the design and construction of the Center for Adolescent Renewal and Education stakeholder identification commenced in the initiation / planning phase. Project team meetings were held to determine the composition of the stakeholder group for the project and simultaneously identify their roles and responsibilities, in addition to their level of influence and general impact on project activities. It was vital to know who the stakeholders are and where they fit in the development and deployment phases of the project to understand and effectively address their expectations or concerns. This process continued throughout the project's life cycle to identify all relevant stakeholders during each phase of project development.

Inputs to this process were the Project Charter, organizational process assets and enterprise environmental factors. A stakeholder Register Matrix used to identify persons, groups, and organizations, that have an interest in the project work, and its results.

4.10.2.1 Stakeholder Analysis

The stakeholder analysis was prepared with the use of existing project documentation, such as the Project Charter, brainstorming techniques, and meetings. Determining the stakeholder influence and impact started during the initial phase of the project phases and will continue until project completion.

Please see chart No. 41 below, depicting stakeholder interest and competence.

Chart No. 41 Stakeholder Analysis (Source: Georges, L.B., Author, June 2023)

Stakeholder	Project involvement	Interest	Competence
Sponsor: Government of India	Approval of Funding	Project success	Financial Support
International Labour Organization	<ul style="list-style-type: none"> • Sponsors' Representative • Approval of Project Charter and all deliverables 	Quality of deliverables and project success	Financial management Knowledge and experience
Office of the Prime Minister	<ul style="list-style-type: none"> • Project Endorsement • Approval of finances 	Project success	Administrative Support and Finance approvals.
Contractor	<ul style="list-style-type: none"> • Responsibility for: building construction coordination of site work and execution of construction deliverables 	Project success	Knowledge and experience

Stakeholder	Project involvement	Interest	Competence
Ministry of Finance	<ul style="list-style-type: none"> Releases funding for the project on a quarterly basis Responsible for approval of procurement procedure Receives project status reports and cost forecasts for the project. 	Project success	Approval and release of funding critical to project success.
Architectural Section and Development Control Authority (DCA) - Department of Physical Development and Urban Renewal.	<ul style="list-style-type: none"> Preparation of all required design, project, and procurement documents. DCA is responsible for providing final building permits for construction. Responsible for project implementation, management, supervision and control 	Project success to ensure that regulatory processes are adhered to and applied.	Knowledge Interpersonal skills and experience
Ministry of Education, Innovation, Gender Relations, and Sustainable Development.	<ul style="list-style-type: none"> Project owner and primary stakeholder Receives reports and leads stakeholder interventions 	Project success	Knowledge and support
Administration CARE	<ul style="list-style-type: none"> Project owner and primary stakeholder Receives reports and collaborates with Ministry of 	Project success	Knowledge and support

Stakeholder	Project involvement	Interest	Competence
	Education on stakeholder interventions		
Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal.	<ul style="list-style-type: none"> Responsible for approval of traffic management plans and other road intervention plans for the project 	Project success	Knowledge Interpersonal skills and experience
Saint Lucia Fire Service	<ul style="list-style-type: none"> Provides all fire safety permits. 	Project success	Knowledge Interpersonal skills and experience
Saint Lucia Solid Waste Management (SLSWMA)	<ul style="list-style-type: none"> Provides permits for management of waste at preconstruction, construction, and post construction phases. 	Project success	Knowledge Interpersonal skills and experience
Service Providers (Telecommunications, Electricity, Water)	<ul style="list-style-type: none"> Guide the design works of relevant professionals in these fields. conduct installation for the same, pre and post construction. 	Project success and regulatory compliance	Knowledge experience and support
Immediate Business Community	<ul style="list-style-type: none"> General feedback on the positives or negative of the construction intervention to normal business activities and road users. 	Minimal disruption in functionality of business entities due to traffic interruptions and a successful project.	Knowledge
	<ul style="list-style-type: none"> May form part of the employed staff. 	Safeguarding the	Knowledge

Stakeholder	Project involvement	Interest	Competence
General Public (Residence within the immediate vicinity)	<ul style="list-style-type: none"> Collaborates at community meetings to provide historical information etc. during the initiation stages of the project. 	environment, employment, and project success	
Political Directorate	<ul style="list-style-type: none"> General oversight and interest in project development and completion. 	Project success	General support and oversight

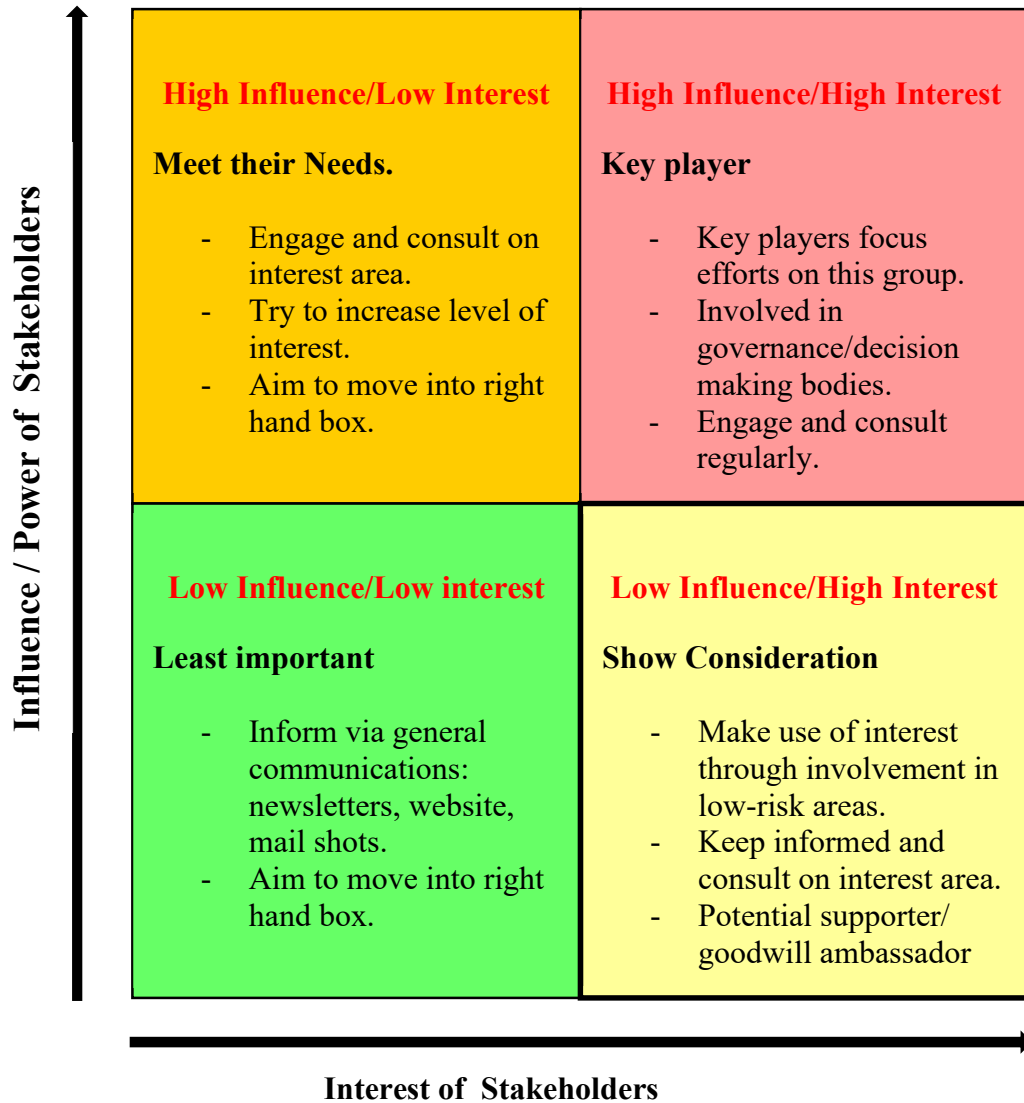
Project stakeholders can be classified into 4 categories:

- High influence/High Interest
- High influence/Low interest
- Low influence/High interest
- Low influence/Low interest

Chart No. 42 below depicts the Stakeholder Influence/Interest Model for the project.

Part No. 42 Influence/Interest Model (Source: Georges, L.B., Author, June 2023)

Level of authority (power) and Level of activity involvement (influence)



The most critical stakeholders are members of the high interest / high influence category.

The analysis of the stakeholders will be executed with the use of expert judgment, lessons learnt, brainstorming techniques, and the results included in the stakeholder registry.

Chart No. 43 below depicts the Register used to document who is impacted by the project.

Chart No. 43 Stakeholder Register (Source: Georges, L.B., Author, June 2023)

ID	Stakeholders	Functional Area	Roles	Responsibilities	Main Expectations	Major Requirements	Influence/Interest (Low-High)
1	Government of India	Government / Finance	Sponsor	Secure financing and ensure that all relevant formalities are realized before transferring funds	That funds are utilized within the agreed time period to avoid cancellation of funding arrangement	Provision of a sound and secure building completed on time and within budget	Medium Influence, High Interest
2	International Labour Organization (ILO)	Project Administration	Sponsor's Representative	To facilitate the approval to sponsor for disbursement of funds. To approve for the Project Schedule, Project Management Plan, stakeholder list etc.	Timely submission of information for preparation of implementation agreements during the initial stages Bi-weekly updates on project activities and use of funds	Sound project management processes and practices and that those activities be undertaken in accordance with local regulations and standards	High Influence, High Interest
3	Office of The Prime Minister	Administrative	Approver	To provide high level approval for initiating project activities inclusive of the use of funds	Economic activity in reference to jobs and the design of a resilient building is enabled	To complete all project activities within time and budget	High Influence, High Interest
4	Contractor	Construction	Contractor	To provide all relevant materials, equipment and services required as per contractual agreement for effective realization of the construction of the project.	Completion of all construction phases within time and budget, understanding the complexity of the project and the associated risks, that	Timely facilitation of work permits and visa requirements for nonnative workers as per immigration rules.	High Influence, High Interest

ID	Stakeholders	Functional Area	Roles	Responsibilities	Main Expectations	Major Requirements	Influence/Interest (Low-High)
				<p>To liaise with project manager (s) in planning and managing daily site operations by main contractors, subcontractors, consultants, service providers etc.</p> <p>To assure that the health and safety of construction workers are following regulatory codes of practice.</p> <p>To establish proper communication systems and mechanisms throughout the construction process at all times</p> <p>To follow architect's instructions throughout the construction process for any unforeseen issues that may arise</p>	<p>may trigger variation, scope creep and huge financial requirements.</p> <p>Continuity especially during critical ventures or time is enabled</p>	<p>Availability of relevant equipment on the island and assistance by local regulatory agencies for importation of non-available equipment needed for the construction process.</p> <p>Fast tracking of duty-free governmental concessions for much needed equipment and materials to be imported.</p> <p>Approval of work programs and activities in a timely manner even when change request are driven by unforeseen Circumstances.</p>	

ID	Stakeholders	Functional Area	Roles	Responsibilities	Main Expectations	Major Requirements	Influence/Interest (Low-High)
5	Ministry of Finance	Finance	Monetary allocations	To provide timely disbursement of funds for realizing payment to contractor for works executed	Timely receipt of payment certificates, status reports and project funding requirements	To stop project and obtain approval for additional funding before allowing the contractor to continue works when changes occur due to unforeseen circumstances and funds to solve the problem surpasses the contingency amount	Low Influence, High Interest
6	Architectural Section and Development Control Authority (DCA) - Department of Physical Development and Urban Renewal.	Technical / Executing Agency / Project Management and Implementation	Architects Designers Authorizing agency	<p>To create building designs and highly detailed drawings by hand and/or by using computer-aided design (CAD) software, for the construction of the project</p> <p>To liaise with construction managers, engineers, and government officials about the feasibility of the project</p> <p>To specify the project requirements and to present proposals, reports, and contracts to the government</p> <p>To estimate project budget, determine timelines and the environmental impact of the project if necessary</p>	That the building structure is designed accurately, safely, economically and meets the requirements of the government	To provide a proposal and feasibility report for the design of the building structure and other project requirements	High Influence, High Interest

ID	Stakeholders	Functional Area	Roles	Responsibilities	Main Expectations	Major Requirements	Influence/Interest (Low-High)
7	Ministry of Education, Innovation, Gender Relations, and Sustainable Development	Project Administration	Owner	To provide general oversight of the project	That the building structure is designed accurately, safely, economically and meets the requirements of the government	Provision of a sound and secure building completed on time and within budget	High Influence, High Interest
8	Administration CARE	Project Administration	Owner	To provides general oversight of the project	That the building structure is designed accurately, safely, economically and meets the requirements of the government	Provision of a sound and secure building completed on time and within budget	High Influence, High Interest
9	Ministry of Infrastructure Ports, Transport, Physical Development and Urban Renewal.	Transportation/ Road design and Maintenance	Infrastructural approval	To approve traffic and site management plans To provide relevant permits	Conducts all construction activities within the confinement of the regulations	Completion and realization of building as per design specification and standards	High Influence, Low Interest
10	Saint Lucia Fire Service	Technical	Fire approval	To approve fire prevention design To provide relevant permits	Conducts all construction activities within the confinement of the regulations	Completion and realization of building as per design specification and standards	High Influence, Low Interest
11	Saint Lucia Solid Waste Management (SLSWMA)	Technical	SLSWMA approval	To approve Saint Lucia 's Solid Waste Management plans To provide relevant permits.	Conducts all construction activities within the confinement of the regulations.	Completion and realization of building as per design specification and standards.	High Influence, Low Interest

ID	Stakeholders	Functional Area	Roles	Responsibilities	Main Expectations	Major Requirements	Influence/Interest (Low-High)
12	Service Providers (Telecommunications, Electricity, Water)	Technical	Service Installers	To realize temporary and permanent installation of services prior to commencing construction activities and after building commissioning respectively.	Conducts all construction activities within the confinement of the regulations.	That all preparator work to receive or support installations have been tested and certified.	High Influence, Low Interest
13	Immediate Business Community	Socio-Economic	Provide feedback	To provide general information of business activities on a daily basis and some history of the area.	Minimal interruptions to businesses and traffic activities during pre-construction and construction phases.	Complete Construction on time.	Low Influence, Low Interest
14	General Public (Residence within the immediate vicinity)	Socio-Economic	Provide feedback	To express their approval/rejection of the project in light of any positive/negative impact on their lives and livelihoods.	To influence the decision to construct or not to construct the project considering the negative/positive impacts on them.	Information about the project and the project impacts in terms of short, intermediate, and long-term on the lives and livelihood of the residence (socio-economic impact) and the environment.	Low Influence, Low Interest
15	Political Directorate	Government	Provide feedback	To oversee the project activities	To promote economic activity in reference to jobs and the design of a resilient building.	To complete all project activities within time and budget.	Low Influence, High Interest

4.10.3 Plan Stakeholder Engagement

Plan stakeholder engagement is the process of developing approaches to involve project stakeholders based on their need's expectations, interests, and potential impact on the project, (PMBOK®Guide, 6th edition, 2017).

Inputs used for this process were project documents (stakeholder register, risk register and the project schedule); organizational process assets (lessons learnt repository on similar realized projects). Expert judgment, meetings and data analysis were also used to plan stakeholder engagement.

For the C.A.R.E project a Stakeholder Engagement Matrix is used to assess and compare the level of stakeholder involvement and participation, between the current and the desired levels for successful project delivery.

Classification of stakeholders for the project were as follows:

- Unaware – Not aware of the project and its potential impacts.
- Resistant – Aware of the project and potential impacts, but resistant to it.
- Neutral – Aware of the project, but neither in support nor opposed.
- Supportive – Aware of the project and supportive of the work and its outcomes.
- Leading – Aware of the project and actively engaged in making sure that the project is successful.

The Stakeholder Engagement matrix in Chart No. 44 depicted below shows the current and desired level of stakeholder engagement needed for the project.

C - represents the current level of engagement

D - represents the desired level of engagement

4.10.4 Stakeholder Engagement Matrix

Chart No. 44 Stakeholder Engagement Matrix (Source: Georges, L.B., Author, June 2023)

Stakeholder Engagement Matrix					
Project Number	2031	Project Name			Project Manager
		Design and Construction of the Center for Adolescent Renewal and Education			Lyndon B Georges
Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Government of India					C,D
International Labour Organization					C,D
Office of the Prime Minister				C,D	
Contractor					C,D
Ministry of Finance				C,D	

Stakeholder	Unaware	Resistant	Neutral	Supportive	Leading
Architectural Section and Development Control Authority (DCA) - Department of Physical Development and Urban Renewal.					C,D
Ministry of Education, Innovation, Gender Relations, and Sustainable Development.				C,D	
Administration CARE				C,D	
Ministry of Infrastructure				C,D	
Saint Lucia Fire Service				C,D	
Saint Lucia Solid Waste Management (SLSWMA)				C,D	
Service Providers (Telecommunications, Electricity, Water)				C,D	
Immediate Business Community			C		
General Public (Residence within the immediate vicinity)				D	
Political Directorate				C,D	

4.10.5 Manage Stakeholder Engagement

Manage Stakeholder Engagement is the process of communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder involvement, (PMBOK®Guide, 6th edition, 2017)


During this process for the design and construction of the Center for Adolescent Renewal and Education, stakeholders were reminded of their roles and responsibilities and appraised on the aims and objectives of the project, associated risks and benefits generated upon completion. The project phases were discussed to obtain much needed feedback and collaboration. During this process it was also essential to inform stakeholders of the need to follow set structures for change request and provide a general synopsis of project expectations for those who were not familiar with a project of that nature. Inputs used to guide the managing stakeholder process for the project were the Communications Management plan, Risk Management Plan, Stakeholder Engagement Plan, Stakeholder Register, and Lessons Learned Register. Tools and Techniques used were expert judgement, interpersonal and team skills and meetings. The project manager and project team responsible for managing the stakeholder process will document feedback and queries raised from all stakeholders ensuring effective exchange of communication among parties. The Issues Log Template will be utilized to document issues or risks identified by stakeholders and to propose solutions to their concerns.

4.10.6 Monitor Stakeholder Engagement

The monitor stakeholder engagement is the process of monitoring stakeholder relationships and tailoring strategies for engaging stakeholders through modifications of engagement strategies and plans (A guide to Project Management Book of Knowledge, 2017). This process is realized throughout the duration of the design and construction of the Center for Adolescent Renewal and Education to maintain, control, and improve the efficiency and effectiveness of stakeholder engagement activities. The project manager will ensure that stakeholders are engaged at relevant stages of project development for continued commitment to project completion, and for feedback on the level of satisfaction of project deliverables. Stakeholder expectations will be managed through frequent communication as they will be called upon when necessary to participate in fundamental decision making on the way forward that would drive project success. Periodically, or as they occur, risks or potential concerns will be prioritized for discussion and consensus involving stakeholders who will be tasked with finding the most appropriate solution to the problem providing an avenue to monitor stakeholder's commitment to ensuring that the project's objectives are realized.

4.10.7 Stakeholder Management Plan Approval

The signatures of the people below indicate an understanding in the purpose and content of this document by those signing it.

Approvers	Title	Signature	Date
Karleen Mason (Dr.)	<i>Executive Director C.A.R.E Ltd.</i>		March 4 th 2023
Claudia Louis (Dr.)	<i>Chief Planning Officer Department of Education, Innovation and Gender Relations</i>		March 4 th 2023
Lyndon B Georges	<i>Chief Architect Department of Physical Development & Urban Renewal</i>		March 4 th 2023

5 CONCLUSIONS

The Design and Construction of the Center for Adolescent Renewal and Education formed part of the overall mandate of the Department of Education, Innovation, Science, Technology and Vocational Training, and the Center for Adolescent Renewal and Education (CARE) destined to provide certified learning opportunities to the Marginalized and underprivileged youth and creating an enabling environment that promotes Social, Economic, and sustainable growth within Saint Lucia for years to come.

To foster positive change, the implementation of this project provided a sense of relief, ownership, and pride, demonstrated, and reflected in day-to-day operations at the new center. The final delivery is intended to be a safe , comfortable, and technologically enhanced learning center with efficient workflows and sound management of project activities as has always been to central government and project success.

It was therefore anticipated that the development of the project management plan has created effective management, and control of all activities leading to finalization of first phase of construction and documenting of lessons learnt at the end of the project lifecycle. Having successfully developed the project management plan provides a template useful to guiding and impacting phases and processes leading to project success.

conclusions as per projects' specific objectives are as follows:

1. The Integration Management Plan showcased long term project purpose while simultaneously aligning stakeholders with the processes involved to develop the project from its inception to completion. The creation of the project charter provided a clear understanding of the projects purpose, associated risks, assumptions, timeframe, deliverables, and responsibilities inter alia, and final approval by the project Sponsor, demonstrating its significance to the projects' development and Successful completion. The plan elaborated the use of templates such as assumptions logs, change request, and lessons learned for Directing, Managing, and monitoring project work as well as informing project stakeholders of the methodology to resolving issues as the arise during the project Lifecycle. This plan is vital to the Design and construction of the Center for Adolescent Renewal and Education and future project implementation exercises because of its informative approach at project initiation to generate stakeholder assurance of the efficiency of project processes to meet predefined goals.
2. The Scope management plan focuses on defined works required to complete the Design and construction of the Center for Adolescent Renewal and Education. the work breakdown structure was used as a tool to clearly define and indicate a sequential decomposition of work packages embodying the entire project, and a WBS dictionary familiarizing key project personnel with an understanding of

respective work package. The Scope management plan establishes parameters delimiting the project activities, and its effective management positively influences clients' expectations, team conduct, schedule and cost variances, resource management, and overall project outcome. The change control system provides a control mechanism to identify, record, approve or reject changes occurring in the project. The transparency of this process prevents Scope creep and enables effective handling of project activities. From logging assumptions to a final registration of lessons learned, the Scope management plan mapped this project from beginning to end and created an enabling environment to control plant, equipment, material, and finances necessary to complete this project.

3. The Schedule / Time management Plan was developed to ensure that this project is completed within the agreed time frame. The critical path and cost baseline being two major utilities of the schedule management plan, assisted in tracking, controlling, and managing the project activities while simultaneously measuring performance, tools and procedures being employed throughout the projects' lifecycle.
4. The Cost Management Plan assisted in estimating, allocating and controlling projects costs through the use and application of the cost baseline. This was vital and assisted the project manager and team to keep the project within the desired budget while measuring and reporting on overall spending. The cost management

plan assisted in overall cost forecasting and efficient management of project expenditures at the various stages throughout the projects' lifecycle.

5. The Quality Management Plan for the Design and construction of the Center for Adolescent Renewal and Education, helped in formalizing quality parameters, procedures, and criteria for managing quality from the planning through design, construction, and final handing over of the project. Quality would further influence cost and schedule throughout the project by offering control of outputs through the application of standards. Quality planning helped the project manager and team to determine the metrics to be used for measuring scope and maintain satisfaction throughout the project at all times.
6. The Resource Management Plan developed for the project resulted in the appropriate classification and efficient use of resources allocated to the project. This assisted in recognition of team members, their identified skill sets and developing systematic approach to planning, drafting, scheduling, and controlling the use of identified resources throughout the project stages and activities, for evaluating and boosting team performance resource scheduling and utilization.
7. The communications management plan developed for the Design and construction of the Center for Adolescent Renewal and Education, formalized, and defined the acceptable mediums for transmitting information between project team members, lead agencies and organizational heads for smooth and efficient dissemination of particulars during the project phases. Timeliness of communication actions were of

utmost importance for ensuring appropriateness of responses to stakeholders and referral agencies. The communication management plan fostered sound team management by defining individual team member responsibilities and establishing the use of the issues-log / escalation template for tracking all actions needing addressing and determining remedying approach from initialization to finalization of the project.

8. All projects are exposed to risks and this one was no different. The Risk Management Plan for the project allowed for proactive risk planning and while new risks can surface, provisions were made to identify, evaluate, mitigate, and control all risks which may occur during the project lifecycle. Understanding risks and their causes is of utmost importance and this was an essential factor in establishing the control mechanisms to categorize them using the RBS. Assessing the impact and probability or occurrence to formulate the risk register for prioritizing the risks. This was beneficial to the project by allowing the project manager and project team to actively engage in monitoring risks and planning and implementing the responses relevant to address risk throughout the project lifecycle.
9. The Project procurement management strategy used for the project was predefined as per the Saint Lucia Public Procurement and Asset Disposal Act, of 2015-2020. The procurement process allowed for the selection of services required for the construction and consultancy phase of the project criteria analysis. The detailed methodology for planning, conducting, and controlling procurements for the

Construction of the Center for Adolescent Renewal and Education project. The procurement management plan assisted in identifying the human resources, services, and goods for the successful completion of the project.

10. The Stakeholder management plan emphasized the relationship between stakeholders, organizations, and the project team. Analyzing the stakeholders allowed for characterizing their level of involvement, interest, and competence in the project. The stakeholder management Plan ensured appropriate engagement independent of stakeholder level of Influence/ Power and Interest in the project. Imperative to their characterization and engagement is also the ability of the project manager and his team to adequately monitor and manage their inputs in the project using the stakeholder register as a source document to inform of their major requirements and expectations. With these the project manager is able to efficiently communicate and engage them on project-related matters.
11. A validation of the Project in the field of regenerative and sustainable development was conducted through the application of P5 Impact Analysis (P5IA) to assess or establish favorable or unfavorable end results to regenerative and Sustainable development. The process was conducted through a tabulated analysis of People , Planet, Prosperity, Process, Products (P5) that involved the situation, the causes , potential impact of the cause and a proposed response. A grading coefficient was applied based on the effects of the impact before and after impact response using an interpretation guideline ranging from 5 (strongly agree) to 1 (strongly disagree). The

overall Impact score after responding to individual Impacts was 4.4, strong indication that the projected outcomes favored sustainability and regenerative development.

6 RECOMMENDATIONS

1. The Department of Physical Development and Urban Renewal (DPDUR) and by extension The Architectural, as the lead agency for realization of design and implementation of government projects should implement as part of the project planning exercises the implementation of an integration management plan for planning the roadmap for the project. This would foster an integral understanding of operations, resources risk inter alia that would be associated with a proposed project and enlighten stakeholders and steering committees committing or not to the intervention.
2. DPDUR as a technical unit of government would benefit greatly from the implementation of sound project management practices in project implementation. Although the intention to create some structure in project implementation exists, the full effect is not felt. A project management specialist is key to creating the level of functionality needed to bring value to projects. There is benefit in adapting to the scope management plan process to set operational parameters from inception and avoid scope creep which most time occurs.
3. Timeliness of project interventions and scheduling of project activities is not apparent in the undertaking of projects by the DPDUR. The architectural section is key to this Department and project implementation is frequently realized by them. Meeting project deliverables are important but without scheduling activities it chaotic and the project goes into a state of imbalance. The Department of Physical Development and Urban Renewal (DPDUR) must request project schedules from the contractors / consultants for tracking project development by its project team and by extension identification of issues at an early stage during the project lifecycle.

4. Cost management is yet another area beneficial to project realization within the public sector. The DPDUR approach to cost management does not take into consideration the inclusion of management reserves as part of its budgeting, neither cost control nor calculation of cost variances. The DPDUR should implement these practices and approaches to determine the performance of the project during a specified time period.
5. Working within the DPDUR has created the awareness of the need to have sound quality management systems in place to manage the outcomes of numerous project activities and processes, that would lead to improved deliverable results. The DPDUR and by extension the architectural section has yet to implement systems to plan, manage and control quality for projects being implemented. And the results of the lack of the same have had financial effects on the state in general. It is recommended that the department should request roles and responsibilities for project stakeholders and project team members and a plan for managing and controlling quality for projects. This will assist in the reduction of project expenditure and delays in scheduled project activities due to bad workmanship and the nonexistence of a quality regime.
6. The staff are confined to in-house resources and in most instances, staff are assigned to more than one project simultaneously. While in most instances this cannot be avoided due to financial impediments impeding the hiring of more staff for project realization. The department can benefit from the implementation of a resource breakdown structure in the planning stage and project resources management process such as drafting of a team charter, responsibility assessment matrix and resource calendar to track, define and manage project resources for individual projects. This will assist in maximizing the use of resources to produce favorable project outcomes.

7. Communication management and control tools for projects are in existence but their usage is not mapped, hence affecting the efficiency of the communication system in place. The DPDUR should implement the use of a communication matrix and issues-log controlling , monitoring, verification, recording, and documenting of information to strengthen and reinforce relationships in the construction project.
8. The DPDUR, although the evidence of associated risks to project are non-avoidable, the risk management process is never fully implemented. With the risk management plan that has been developed, it is intended to implement the plan for projects moving forward and encourage the DPDUR to make it obligatory to plan, Identify, perform qualitative and quantitative risk analysis, plan and implement risk responses for controlling risk as they occur throughout the project’s lifecycle. This would lead to efficient and consistent operations and the proactive addressing of issues and situations that may arise.
9. The procurement process is well defined in the Saint Lucia Public Procurement and Asset Disposal Act, of 2015-2020, for government projects. The Central Procurement Unit there needs to sensitize private companies on the procurement procedures, to reduce the dependency on employed staff to educate companies of the processes Hence delaying implementation of contracted work.
10. A well-managed stakeholder engagement process will contribute to togetherness reduced negativity in the work environment and increasing the economic sustainability of the project. It is hence advised that DPDUR incorporates stake holder management plans as fundamental components to drive project planning and implementation. Remembering that keeping the stakeholders informed is the principle of maintaining a balance between satisfaction and a successful project.
11. The P5 Impact Analysis is not implemented as part of project realization and implementation at the Department of Physical Development and Urban Renewal. As an analytical tool there is merit in its use to assess the sustainability level of a

project during the initial development of a project plan. I hence recommend that The DPDUR incorporate the P5IA as an Analytical tool for projects viability in the fields of regenerative and sustainable development to proactively assess and address the impacts of project processes on sustainability.

7 VALIDATION OF THE PROJECT IN THE FIELD OF REGENERATIVE AND SUSTAINABLE DEVELOPMENT

7.1 Conceptual relationship of Regenerative Development and Project Management.

Modern societal structure has transformed drastically from the customs of the ancestral age to a technologically driven reality. Modernization has introduced mechanization as a means of assisting in mass production with the intention of satisfying man's basic needs while at the same time reducing production time and lowering labour costs. Pollution, overconsumption, and massive destruction of nature are recorded as the results of some, if not most, of mankind's technological advances.

Is regenerative development a key concept to drive project management practices, hence reversing the planetary damage, and allow for life on the planet to continue?

According to (Gabel, 2015-2020), "regenerative development is the use of resources to improve society's wellbeing in a way that builds the capacity of the support systems needed for future growth." Regenerative development seeks to replace and replenish capacity, regenerate the economic development model, focus on all elements as a part of a wider system considering how they affect other systems, connect the pollution from one industrial plant to the input channels of another thereby turning waste into resources.

7.2 Sustainability Management Plan (SMP)

According to GPM® (2019) a Sustainability Management Plan (SMP) describes how sustainability will be addressed during a project. P5 (People , Planet, Prosperity, Process, Products) has an integral role in developing an SMP as P5 identifies the subjects to be addressed.

An SMP should generally include:

- Purpose
- Approach
- Roles and Responsibilities
- Budget
- Key Performance Indicators for Sustainability
- Impact of Scope Exclusions on Sustainability
- Reviews and Reporting
- P5 Impact Analysis

7.2.1 PSIA- Product Impacts & Process (Project Management) Impacts - (Source: Georges, L.B, Author, February 2023)

Figure 25 Product Impacts & Process (Project Management) Impacts

Category	Subcategory	Element	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change	
2.1 Product Impacts									
	2.1.1	Lifespan of the product	The project is design taking into consideration all the hazards that surrounds it and will be constructed in accordance with standard aligned to the zone and Physical planning and development requirements and also required standards for a Technical and Vocational school.	Non compliance with construction and design standards can lead to and unsafe building and failed project.	4	Realization of regular inspection site inspection and construction site meetings for clarification of doubts and adherence to standards through the Project Life Cycle .	5	1	
	2.1.2	Servicing of product	The Project is Located about 20m from a petroleum storage facility and approximately 800m to 100m from the state electricity generating company.	can worsen significantly levels of pollutions at	4	Assure all Local Planning laws are adhered to and If necessary creat an addition buffer to guard against all potential Threats.	5	1	
2.2 Process (Project Management) Impacts									
	2.2.1	Effectiveness of project processes	A feasibility Study of the zone and site was undertaken.	Zone is prone to Flooding during severe torrential rains in times of troughs, Hurricanes and storms.	4	Since to date the site has never flooded during severe torrential rains, added precautions were taken during design to raise the Land profile and additional 600mm and propose mitigating and preventative actions when project is operationalized, to guard against any unforeseens.	5	1	
	2.2.2	Efficiency of project processes	Project Implementation was delayed due to last minute Stakeholder change requests.	Delays to the Tripple Constraint (Time, Cost, Scope) and by extension Project Implementation.	4	Maintain A log of all project revision meetings and decisions taken. Also Implement a change control mechanism to manage change request in a timely manner.	5	1	
	2.2.3	Fairness of project processes	Numerous Stakeholder and steering committee meetings.	Long meetings where alot is discussed. May cause team to loose track of meeting objectives.	3	Implement Project Management systems and have a dedicated Scribe for note taking and preparing Minutes of meeting for circulation. Circulate meeting agenda before hand and start every meeting with a revision of Minutes from previous Meeting.	5	2	
					Product and Process Average	3.8		5.0	1.2

This impact will improve the project outcome(s) from a sustainable perspective.
 5 = Strong 4 = Agree 3 = Neutral 2= Disagree 1= Strongly Disagree

7.2.2 PSIA - People (Social) Impacts - (Information Source: Georges, L.B, Author, February 2023)

Figure 26 People (Social) Impacts

Category	Subcategory	Element	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
3 People (Social) Impacts								
3.1 Labor Practices and Decent Work								
	3.1.1	Employment and staffing	In adequate Skilled Labourers and staff to ensure effective implementation of project phases.	substandard work and increased expenditure due to corrective work to be done.	3	Request previous employment details and references before confirming employment and placement.	5	2
	3.1.2	Labor/management relations	Non Adherence to the Labour code.	Penalties, lawsuit, loss of credibility, loss of contract, and maybe even closure of the business.	4	Ensure Adherence to Labour Laws at all times.	5	1
	3.1.3	Project health and safety	Non Adherence to Organizational Safety and Health (OSH) requirements while on the Job.	Illness, death, disrupted work Schedule.	5	Adherence to Organizational Safety and Health (OSH) requirements while on the Job.	5	0
	3.1.4	Training and education	Staff may not have the capacity to adequately interpret drawings and sketches.	Incorrect implementation of works on site especially when not guided by suitable qualified supervisor.	4	Ensure Adequate chain of command and transfer or flow of information from Architects and other Key Specialists / Consultants is adhered to by establishing a hierarchy system for operational purposes.	5	1
	3.1.5	Organizational learning	The Area did not contain any functional technical Vocational School present.	Residents may not have an immediate appreciation of the benefits such an entity within close proximity.	4	Engage in community meeting and media presentation on the intentions of the proposed project and the benefits derived from similar established projects, locally, Regionally and internationally.	5	1
	3.1.6	Diversity and equal opportunity	Recruitment of male and female Staff .	Individuals can feel discriminated.	2	Create employment oportunities based on qualifications and experiences and not gender preference.	3	1
	3.1.7	Local competence development	Hiring skilled Labor from outside the country	Not beneficial to locally skilled labourers.	4	Ensure prioritization of locally skilled residents.	5	1
3.2 Society and Customers								
	3.2.1	Community support	N/A	N/A		N/A		
	3.2.2	Public policy compliance	N/A	N/A		N/A		
	3.2.3	Protection for indigenous and tribal peoples	N/A	N/A		N/A		
	3.2.4	Customer health and safety	Project Site is near a major highway, opposite a commercial store and within close vacinity to a rural community.	Individuals can access the worksite and get injured	4	Enclose worksite with Hoarding fence; ensure signage are placed for pidedrian and traffic purposes and educate community about workplace hazards.	5	1

Univer

This impact will improve the project outcome(s) from a sustainable perspective.
 5 = Strong 4 = Agree 3 = Neutral 2= Disagree 1= Strongly Disagree

7.2.3 P5IA- People (Social) - (Source: Georges, L.B, Author, February 2023)

Figure 27 People (Social)

Category	Subcategory	Element	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change	
		3.2.4	Customer health and safety	Project Site is near a major highway, opposite a commercial store and within close vicinity to a rural community.	Individuals can access the worksite and get injured	4	Enclose worksite with Hoarding fence; ensure signage are placed for pedestrian and traffic purposes and educate community about workplace hazards.	5	1
		3.2.5	Product and service labeling	N/A	N/A	N/A			
		3.2.6	Market communications and advertising	N/A	N/A	N/A			
		3.2.7	Customer privacy	N/A	N/A	N/A			
3.3 Human Rights									
		3.3.1	Non-discrimination	Non optimization of work processes in line with approved labour practices and standards for site operations.	Delays on time, scope and cost.	3	Adherence to Standard operating procedures for each individual job description relating to the project.	3	0
		3.3.2	Age-appropriate labor	Underaged labours working on site.	Non-Compliance with Labour Laws.	1	Checklist of documents to produce for consideration for employment and verification of recieved document with state employment agencies for legality.	2	1
		3.3.3	Voluntary labor	N/A	N/A	N/A			
3.4 Ethical Behavior									
		3.4.1	Procurement practices	Procurement procedures not adhered to.	Reinitiation of procurement process and additional delays for time and Schedule.	2	Adherence to Public Procurement Act for Project Initiative Through the project Life Cycle.	5	3
		3.4.2	Anti-corruption	Non-Adherence to procurement Act to guide procurement process.	Legal Implications, Reinitiation of procurement process and additional delays for time and Schedule.	2	Adherence to Public Procurement Act for Project Initiative Through the project Life Cycle.	5	3
		3.4.3	Fair competition	Timely informed advertising of project initiative in accordance with Public Procurement Act.	Legal Implications, Reinitiation of procurement process and additional delays for time and Schedule.	2	Adherence to Public Procurement Act for Project Initiative Through the project Life Cycle.	5	3

This impact will improve the project outcome(s) from a sustainable perspective.
 5 = Strong 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly Disagree

People Average 3.1 4.5 1.4

7.2.4 P5IA – Planet (Environmental) Impacts-Transport - (Source: Georges, L.B, Author, February 2023)

Figure 28 Planet (Environmental) Impacts-Transport

Category	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
Subcategory						
Element						
4 Planet (Environmental) Impacts						
4.1 Transport						
4.1.1 Local procurement	Difficulty to obtain required quantity of building materials on island from suppliers.	Delays in construction processes and project schedule	3	Stock up on building materials at the beginning of the project by purchasing from multiple suppliers; make advance payments for what's not in stock and pay additional for air freight deliveries to reduce on delivery time.	5	2
4.1.2 Digital communication	Telecommunication providers are not always able to assure reliable services.	Delays in receipt of formal and informal verbal/written information from key stakeholders in a timely manner to guide project activities.	3	Contractual arrangements with Telecommunication providers for dedicated connection speeds and secure mobile plans for key works.	5	2
4.1.3 Traveling and commuting	Rehabilitation of West Coast Road will negatively impact transportation of building materials to the construction site and transportation of waste material from the construction site and to the Landfill.	Delays on the Scope of works and schedule of activities on a daily basis.	4	Use weekends to stock up on building materials on site for the upcoming week and waste material can be cart away from site during normal working hours.	5	1
4.1.4 Logistics	Deficient planning	Delays on the Triple Constraint (Time, Cost, Scope)	3	Improved and informed realistic planning.	4	1

This impact will improve the project outcome(s) from a sustainable perspective.

5 = Strong 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly Disagree

7.2.5 P5IA- Planet (Environmental) Impacts- Land, Water, Air – (Source: Georges, L.B, Author, February 2023)

Figure 29 Planet (Environmental) Impacts- Land, Water, Air

Category	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
Subcategory						
Element						
4 Planet (Environmental) Impacts						
4.2 Energy						
4.2.1 Energy consumption	Use of fuel driven equipment during construction	Increase Co2 emmissions in the atmosphere	2	Using fuel efficient equipment	4	2
4.2.2 CO2 emissions	using fueled engines and lack of timely maintenance and servicing.	Increase Co2 emmissions in the atmosphere	2	Using fuel efficient equipment and practicing timely maintenance of equipment and machines.	4	2
4.2.3 Clean energy return	Lack of green energy harnessing and storage for reuse.	Increase consumption of fossile fuels and general atmopheric contamination.	2	Contract Clean energy providers	4	2
4.2.4 Renewable energy	Increase operating cost due to high non renewable electricity consumption.	Increase contractors overall expenditure during the project.	2	Use PV panelles and solar lighting for keeping the site weel lit and to harness and store energy for reuse.	4	2
4.3 Land, Water, and Air						
4.3.1 Biological diversity	No adherence to recommendations from Environmental Impact Assessment (EIA)	Distraction of biological diversity leading to imbalance in the ecosystems	2	Clerk of works (COW) to maintan a check list of reccommendation and adapt strict guidelines to implement reccommendations. Penalties for no adherence should be outlined in construction contract.	4	2

This impact will improve the project outcome(s) from a sustainable perspective.
 5 = Strong 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly Disagree

7.2.6 P5IA- Planet and Consumption – (Source: Georges, L.B, Author, February 2023)

Figure 30 Planet and Consumption

Category	Subcategory	Element	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change
	4.3.2	Water and air quality	No adherence to environmental health guidelines and recommendations.	Water and air pollution causing workers to get sick	2	Clerk of works (COW) to maintain a check list of recommendation and adapt strict guidelines to implement recommendations. Penalties for no adherence should be outlined in construction contract.	4	2
	4.3.3	Water consumption	No adherence to technical requirements for construction activities.	Disfunctional construction site prone to accidents occurring.	2	Clerk of works (COW) to maintain a check list of recommendation and adapt strict guidelines to implement recommendations. Penalties for no adherence should be outlined in construction contract.	4	2
	4.3.4	Sanitary water displacement	No adherence to technical requirements for construction activities.	Ground water pollution	2	Clerk of works (COW) to maintain a check list of recommendation and adapt strict guidelines to implement recommendations. Penalties for no adherence should be outlined in construction contract.	4	2
4.4 Consumption								
	4.4.1	Recycling and reuse	Lack of proper sorting of construction materials.	Compromising of recycling or Resusing processes.	3	Establish gabbage sorting procedure to be managed by clerk of works of site supervisor.	5	2
	4.4.2	Disposal	Little or no application of set processes and procedures.	No adherence to technical standards and specifications.	3	Maintain correctly sized gabbage disposal bins on site and assure adherence to technical requirements on approved development plans.	5	2
	4.4.3	Contamination and pollution	No adherence to technical requirements for construction activities.	Unhealthy Construction Site Leading to low productivity.	3	Clerk of works (COW) to maintain a check list of recommendation and adapt strict guidelines to implement recommendations. Penalties for no adherence should be outlined in construction contract.	4	1
	4.4.4	Waste generation	No adherence to technical requirements for construction activities.	Distraction of biological diversity leading to imbalance in the ecosystems and a disfunctional construction site prone to accidents occurring.	3	Clerk of works (COW) to maintain a check list of recommendation and adapt strict guidelines to implement recommendations. Penalties for no adherence should be outlined in construction contract.	4	1
					Planet Average	2.6	4.3	1.8

This impact will improve the project outcome(s) from a sustainable perspective.
 5 = Strong 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly Disagree

7.2.7 P5IA- Prosperity (Economic) Impacts – (Source: Georges, L.B, Author, February 2023)

Figure 31 Prosperity (Economic) Impacts

Category	Subcategory	Element	Description (Cause)	Potential Impact	Impact Score Before	Proposed Response	Impact Score After	Change	
5 Prosperity (Economic) Impacts									
5.1 Business Case Analysis									
	5.1.1	Modeling and simulation	N/A	N/A		N/A			
	5.1.2	Present value	Phase one (1) of the project will be completed within the available budget from project sponsor.	Possible acceptance from sponsors for additional financial support.	3	Prepare for Phase two of project	4	1	
	5.1.3	Direct financial benefits	Elimination of operational cost due to closing of the Four (4) satellite offices.	Increased capital for realization of additional training activities.	3	Creation of new schedule for new courses to be offered.	4	1	
	5.1.4	Return on investment	No additional monies spent	Project remains within budget.	3	Working efficiently to control costs and stay on schedule.	4	1	
	5.1.5	Benefit-cost ratio	Neglecting the cost benefit analysis	The project is expected to deliver a negative net present value to its stakeholders.	2	Develop a Forecast of Investments, Costs and Benefits.	4	2	
	5.1.6	Internal rate of return	Not selecting a contractor with requisite technical skills and experience to realize the construction works.	Low implementation and poorly realised deliverables could trigger increased expenditure.	3	Create a checklist of qualifying requirements for procuring services.	4	1	
5.2 Business Agility									
	5.2.1	Flexibility/optionality	Working Overtime can ensure timely completion of tasks and deliverables.	Inability to meet project and stakeholder requirements.	3	Try flexible work schedules to reduce overtime.	4	1	
	5.2.2	Business flexibility	Lack of adaptability to changing circumstances.	unable to compete	3	Encouraging sharing of opinions and and brainstorming activities to adapt to changing circumstances.	4	1	
5.3 Economic Stimulation									
	5.3.1	Local economic impact	Lack of fully equiped vocational institution to train the marginalized youth and other individuals in basic and intermediate Technical Vocational and Educational (TVET) training.	decline in skilled work force.	2	Begin to import skilled labours from early to ensure shortage of workes will not delay construction and ensure budget contain contingency for imported hire.	4	2	
	5.3.2	Indirect benefits	Accessibility for all	overbooking	2	Create Schedule for shift system	5	3	
					Prosperity Average	2.7		4.1	1.4
					Overall Average	2.9		4.4	1.5

This impact will improve the project outcome(s) from a sustainable perspective.
 5 = Strong 4 = Agree 3 = Neutral 2= Disagree 1= Strongly Disagree

7.3. Interpretation of P5 Impact Analysis

According to (GPM® Global.,2022) The guideline to interpreting the P5 Impact Analysis Template is as follows:

5 = Strongly agree 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly disagree

Strongly agree means that this impact will improve the project's outcome(s) from a sustainability perspective.

Neutral means that this impact is not expected to affect the project's outcome(s) from a sustainability perspective.

Strongly disagree means that this impact will worsen the project's outcome(s) from a sustainability perspective.

Product and Processes averaged 3.8.

People averaged 3.1.

Planet averaged 2.6.

Prosperity averaged 2.7.

This is a strong indication that the projected outcomes of the project favor sustainability and that the project is on track to contributing positively to improving the environmental impact of its coming into being.

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APPENDICES

Appendix 1: FGP Charter

**CHARTER OF THE PROPOSED
FINAL GRADUATION PROJECT (FGP)**

1. Student name

Lyndon Barry Georges

2. FGP name

Development of a Project Management Plan for the Design and Construction of a Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia.

3. Application Area (Sector or activity)

Architecture – Construction / Institutional


4. Student signature



5. Name of the Graduation Seminar facilitator

Roger Valverde Jimenez

6. Signature of the facilitator



ROGER
EDUARDO
VALVERDE
JIMENEZ
(FIRMA)

7. Date of charter approval

21 January 2023

8. Project start and finish date

Project Start:
09-Jan-23

Project Ends:
26-Feb-23

9. Research question

What phases and processes should allow for a Development of a Project Management Plan for the Design and Construction of a Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia?

10. Research hypothesis

Is it possible to developing a Project Management Plan for the Design and Construction of the Center for Adolescent Renewal and Education in Cul Du Sac, Saint Lucia, that would positively impact the phases and processes leading to project success.

11. General objective

1. To develop a project management Plan aligned to best practices of the Project Management Institute (PMI), for managing the procedures and processes that would increase the possibilities of project success for the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.), and assess the projects end results using regenerative and or sustainable development.

12. Specific objectives

1. To create a project charter that authorizes the project and documents the objectives, goals, and business case of the project.
2. To create an Integration Management Plan to ensure that all project work processes and activities run efficiently in a coordinated manner for timely completion of project and within budget.
3. To create a Scope Management Plan which ensures all project activities are realized within a set structure that enables documenting, monitoring and control of project resources which are required to achieve project objectives and success.
4. To create a Schedule / Time Management Plan which seeks to ensure the prioritization of planned project activities and their achievement or realization within stipulated time frames, for greater productivity and efficiency.
5. To develop a Cost Management Plan for managing and controlling overall costs aligned to resources and project activities in relation to the cost baseline and ensuring they are kept within budget limits.
6. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality that adheres to quality standards and project objectives throughout the project's life cycle.

7. To develop a Resource Management Plan to assist in optimizing resource availability and use, by identifying, quantifying, acquiring, and managing the resources required for project's successful completion.
8. To create a Communications Management Plan to serve as a framework that guides, outlines, and details communications needs and expectations to meet project deliverables throughout the life of the project.
9. To develop a Risk Management Plan which would assist in the proactive identification, monitoring, and analysis of internal or external situations that may arise and impact the project positively or negatively through its life cycle.
10. To develop a Procurement Management Plan to define the methodological approach for managing the processes of obtaining goods and or services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project.
11. To create a Stakeholder Management Plan that ensures the effective involvement, identification, control, and categorization of stakeholders.
12. To explain, using regenerative and sustainable development, the relationship and impact of the project execution and operation of the final product to establish which effects of the end results favor or disfavor regenerative or sustainable development.

13. FGP purpose or justification

For several years, the administration of CARE has been burdened with the management of its operations at learning centres in various districts on island. Currently, four learning centres have been identified on the island namely in Gros Islet, Odsan, Anse La Raye and Soufriere, all managed by the head office of CARE. This has brought to light a few challenging issues faced by CARE's administration:

- Lack of proper monitoring performances for both teachers and learners.
- Inventory and accounting issues become tedious.
- Difficulty in implementing a proper maintenance schedule for each physical infrastructure.
- Increased fees for the use of utility services.

The administration of CARE is of the opinion that implementation of this project will provide a sense of relief, ownership, and pride, demonstrated, and reflected in its day-to-day operations at the proposed centre. As a new construction project, the goal is to design and construct the first phase of an aesthetically pleasing state-of-the-art TVET facility that is functional, secure, sustainable and in accordance with ILO requirements, local, regional, international and TVET facilities standards regulatory standards.

The project selected, "Upgrading Saint Lucia's capacity to provide impactful vocational training for marginalized youth" seeks to address the need to upgrade training facilities, capacity of instructors and offer coordinated services from national stakeholders' to Saint Lucia's youth.

The development and implementation of a project management plan will assist in structuring project processes and activities to increase the chances of project success.

14. Work Breakdown Structure (WBS) table.

1. Graduation Seminar

1.1. FGP Deliverable

1.1.1. Charter

1.1.2. WBS

1.1.3. Chapter 1. Introduction

1.1.4. Chapter II. Theoretical Framework

1.1.5. Chapter III. Methodological Framework

1.1.6. Annexes

1.1.6.1. Bibliography

1.1.6.2. Schedule

1.2. Graduation Seminar Approval

2. Tutoring Process

2.1. Tutor

2.1.1. Tutor Assignment

2.1.2. Communication

2.2. Adjustments of Previous Chapters (if needed)

2.3. Chapter IV. Regenerative and Sustainable Development (results)

2.4. Chapter V. Conclusion

2.5. Chapter VI. Recommendations

2.6. Tutor Approval of Document

3. Reading and Reviews

3.1. Reviews Assignment requests

3.1.1. Assignment of two reviewers

3.1.2. Communication

3.1.3. FGP Submission to reviewers

3.2. Reviewers work

3.2.1. Reviewer 1.

3.2.1.1. FGP reading.

3.2.1.2. Reading No. 1 (Report)

3.2.2. Reviewer 2.

3.2.2.1. FGP reading.

3.2.2.2. Reading 1 report

4. Adjustments

4.1. Report for reviewers

4.2. FGP Update

4.3. Second review by reviewers

5. Presentation to Board of Examiners

5.1. Final Review by board

5.2. FGP Grade report

15. FGP budget

The total budget for development of the FGP document is estimated at US\$ 700.00.

- Research and development - US\$ 200.00
- Software licensing - US\$ 250.00
- Data and networking - US\$ 150.00
- Printing and revisions - US\$ 100.00

16. FGP planning and development assumptions.

- That backfilling of the project site will be necessary due to flooding of the zone during extreme rainy conditions.
- Procurement of goods and services is available locally.
- Project deliverables would be completed in accordance with the triple constraint.
- That delays due to inclement weather and emerging pandemic(s) will arise.
- All stakeholders will adhere to agreed protocols for change requests and decision making.
- A phase approach be considered at the implementation stage due to Limited funding.
- Seamless integration of construction activities with on-going road rehabilitation projects.
- Timely approval from regulatory authorities.
- Timely availability of resources.

17. FGP constraints

- Only one-third of the site is flat land and is accessible from the main road. The remainder of the site is at a much higher elevation, which may not be the best location for the Centre.
- The site is within close proximity to a crude oil storage and transshipment facility.
- Working hours of 8am to 4:30pm and at nights from 6pm to 12 pm will be subject to all regulatory codes of practice.
- There is a limited budget not exceeding US\$871,314 (approximately \$2,367,273.00 XCD).
- The project to be completed within the next 2 years.

18. FGP development risks

- Unexpected flooding due to hurricanes and troughs which might delay construction phases due to closure of site.
- Fire due to close proximity to crude oil storage facility can cause immediate closure of site.
- Occurrence of mild to low Seismic activity during construction due to Saint Lucia being a volcanic island.
- Untimely payments for completion of work phases may result in reduced productivity and untimely deliverables.
- Poor communication mechanisms and the like occurrence of Illnesses and communicable diseases can affect workers performance and inadvertently impact the project negatively.

19. FGP main milestones

Deliverable	Finish estimated date
1.1 FGP Deliverable	16-Jan-2023
1.1.1 FGP Charter	22-Jan-2023
1.2 Graduation Seminar Approval	23-Jan-2023
2.1 Tutoring	25-Jan-2023
2.1.1 Tutor Assignment	15-March-2023
2.2 Adjustments of previous chapters	24-March-2023
2.3 Regenerative and sustainable development (results)	26-March-2023
3.1 Reviewers assignment request	15-June-2023
3.1.1 Assignment of two reviewers	15-June-2023
3.2 Reviewers work	20-June-2023
3.2.1 Reviewer 1	23-June-2023
3.2.2 Reviewer 2	23-June-2023
4.1 Report for reviewers	03-July-2023
4.2 FGP update	04-July-2023
5.1 Final review by board	07-July-2023
5.2 FGP grade report	13-July-2023

20. Theoretical framework

20.1 State of the “matter”

The focal point of this project is Upgrading Saint Lucia’s capacity to provide impactful vocational training for marginalized youth. It intends to address, the need to upgrade training facilities, capacity of instructors and offer of coordinated services from national stakeholders to Saint Lucia’s youth. At present, C.A.R.E. offers alternative educational programming, with an emphasis on life skills development and technical and vocational education and training (TVET) for marginalized youth (primarily ages 12-19 years) at four (4) satellite locations.

The proposal is to design and construct an institute to consolidate these four (4) centers and expand C.A.R.E.’s current services to include for mature ages of 20-35 years while increasing the variation of courses offered.

20.2 Basic conceptual framework

List of the basic concepts to be included in the document.

- Regenerative and sustainable design comparative analysis
- FGP charter
- Project management and construction

21. Methodological framework

Chart No. 45 Methodological framework (Source: Georges, L.B., Author, February 2023)

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
1. To create a project charter that authorizes the project and documents the objectives, goals, and business case of the project.	Project Charter	<p>Primary:</p> <p>Personal Steering Committee and zoom (video conference) meetings with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect (Department of Physical Development and Urban Renewal) and the Ministry of Education.</p> <p>Secondary:</p> <p>PMBOK®Guide Sixth & Seventh edition, Internet, C.A.R.E website.</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Project Charter.	<ul style="list-style-type: none"> Assumption Log Milestone Schedule Key Stakeholder List 	Completion of Project Charter to be realized within one work week.
2. To create an Integration Management Plan to ensure that all project work processes and activities run efficiently in a coordinated manner for timely completion of project and within budget.	Integration Management Plan	<p>Primary:</p> <p>Personal meeting with key stakeholders from C.A.R.E , TVET, Project Architect (Department of Physical Development and Urban Renewal) and the Ministry of Education, communication via telephone, zoom conference calls and emails.</p> <p>Secondary:</p> <p>PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Integration Management plan to assist in completion of the project within budget.	Integration Management Plan Template	<ul style="list-style-type: none"> That resources within three working days to complete this plan. That financing will be made available one month before commencing works.
3. To create a Scope Management Plan which ensure all project activities are realized within a set structure	Scope Management Plan	<p>Primary:</p> <p>Personal and zoom (video conference) meetings with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect (Department of Physical Development and</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Scope	<ul style="list-style-type: none"> Decomposition Expert Judgement WBS 	That the triple constraint remains unaltered during the planning stage.

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
that enables documenting, monitoring and control of project resources which are required to achieve project objectives and success.		Urban Renewal) and the Ministry of Education. Secondary: PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.	Management plan and ensuring that project meets desired objectives.	<ul style="list-style-type: none"> Requirements Matrix 	
4. To create a Schedule / Time Management Plan which seeks to ensure the prioritization of planned project activities and their achievement or realization within stipulated time frames, for greater productivity and efficiency.	Schedule / Time Management Plan	Primary: Personal and zoom (video conference) meeting with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect (Department of Physical Development and Urban Renewal) and the Ministry of Education. Secondary: PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Schedule/Time Management plan to ensure timely completion of the project.	<ul style="list-style-type: none"> Decomposition Expert Judgement Activity List Milestone List Network Diagrams Schedule Management Plan Template. 	That the project has to completed within the given time frame.
5. To develop a Cost Management Plan for managing and controlling overall costs aligned to resources and project activities in relation to the cost baseline and ensuring they are kept within budget limits.	Cost Management Plan	Primary: Personal and zoom (video conference) meeting with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect, Quantity Surveyor (Department of Physical Development and Urban Renewal) and the Ministry of Education Secondary: PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Cost Management plan to ensure that the project overall cost remains within budget.	<ul style="list-style-type: none"> Cost Estimates Microsoft Project PRO 2021 budgeting template. Activity List, Sequencing and Required Resources Table Project Budget Chart Data Analysis /Graphs etc. Cost Management Plan Template 	The overall project cost must not exceed the available budget.

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
6. To develop a Quality Management Plan that ensures the planning, assurance, and control of quality that adheres to quality standards and project objectives throughout the project's life cycle.	Quality Management Plan	<p>Primary:</p> <p>Personal and zoom (video conference) meeting with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect, Quantity Surveyor (Department of Physical Development and Urban Renewal) and the Ministry of Education.</p> <p>Secondary:</p> <p>PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Quality Management plan to ensure that quality is controlled and adhered to.	<ul style="list-style-type: none"> Matrix Diagrams Quality Reports Quality Checklists and Sheets Flow Charts Quality Management Plan Template 	That project consultants are available on request days to assure certification of specialist activities within the hour of realization of specified activities on designated days as per contractual arrangements.
7. To develop a Resource Management Plan to assist in optimizing resource availability and use, by identifying, quantifying, acquiring, and managing the resources required for project's successful completion.	Resource Management Plan	<p>Primary:</p> <p>Personal and zoom (video conference) meeting with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect, Quantity Surveyor (Department of Physical Development and Urban Renewal) and the Ministry of Education.</p> <p>Secondary:</p> <p>PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Resource Management plan to ensure optimization of project resources for successful completion.	<ul style="list-style-type: none"> Resource Calendar Resource Breakdown Structure Change Request Template Data Analysis Resource Management Plan Template 	<ul style="list-style-type: none"> That all human resources will be available throughout the work week and at stipulated working hours. That resource costs remain within the project budget. That all resources are readily available one week before every project activity.
8. To create a Communications Management Plan to serve as a framework that guides, outlines, and details	Communication Management Plan	<p>Primary:</p> <p>Personal and zoom (video conference) meeting with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect, Quantity Surveyor (Department of Physical</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the	<ul style="list-style-type: none"> Stakeholder Engagement Matrix Stakeholder Assessment Matrix 	That communication equipment is replaced or repaired

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
communications needs and expectations to meet project deliverables throughout the life of the project.		<p>Development and Urban Renewal) and the Ministry of Education.</p> <p>Secondary:</p> <p>PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.</p>	<p>Communications Management plan that keeps stakeholders engaged and ensure that project expectations and deliverables are meet.</p>	<ul style="list-style-type: none"> • Communication Technology and Methods. • Communication Management Plan Template • Communication Matrix 	<ul style="list-style-type: none"> • within two days of non-functionality. • That all all-service contracts with telecommunication companies are paid for. • That Hardcopies of all reports, minutes, drawings, and instruction are hand delivered within two working days of having sent emailed copies.
9. To develop a Risk Management Plan which would assist in the proactive identification, monitoring, and analysis of internal or external situations that may arise and impact the project positively or negatively through its life cycle.	Risk Management Plan	<p>Primary:</p> <p>Personal and zoom (video conference) meeting with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect, Quantity Surveyor (Department of Physical Development and Urban Renewal) and the Ministry of Education</p> <p>Secondary:</p> <p>PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.</p>	<p>The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Risk Management plan to ensure efficient and effective management of risk.</p>	<ul style="list-style-type: none"> • Risk Breakdown Structure • Risk Register • Risk Management Plan Template • Probability and Impact Scales • Qualitative Risk Analysis • Quantitative Risk Analysis 	<ul style="list-style-type: none"> • That adequate funding is available within the project budget to cater for such risk in the event that anyone would occur. • That if occurrence of any risk exceeds the given budget a contingency plan would be in place to acquire funding

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
					within two weeks of identification of risk.
10. To develop a Procurement Management Plan to define the methodological approach for managing the processes of obtaining goods and or services between buyer and seller (s) for the purposes of contract implementation and monitoring of procurement processes for this project.	Procurement Management Plan	<p>Primary:</p> <p>Personal and zoom (video conference) meetings with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect, Quantity Surveyor (Department of Physical Development and Urban Renewal) and the Ministry of Education.</p> <p>Personal meeting with Director Procurement Unit, Ministry of Finance and Economic Development</p> <p>Secondary:</p> <p>PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database. Government of Saint Lucia Electronic Procurement Website.</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Procurement Management plan to ensure effective handling of procurement management processes.	<ul style="list-style-type: none"> • Government of Saint Lucia Procurement Policy/ Act. • Advertising and Bidder Conference • Contracts and Agreements • Independent Cost Estimates • Bid documents template. • Procurement Management Plan Template. 	The procurement strategy will only be restricted to bidders within St. Lucia and not open to bidders regionally or internationally.
11. To create a Stakeholder Management Plan that ensure the effective involvement, identification, control, and categorization of stakeholders.	Stakeholder Management Plan	<p>Primary:</p> <p>Personal and zoom (video conference) meeting with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect, Quantity Surveyor (Department of Physical Development and Urban Renewal) and the Ministry of Education</p> <p>Secondary:</p> <p>PMBOK®Guide Sixth & Seventh edition, Internet, PMI Database.</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to develop the Stakeholder Management plan to ensure adequate engagement of stakeholders during the project stages.	<ul style="list-style-type: none"> • Stakeholder Management Plan Template • Stakeholder register • Change Request Template • Meetings and Minutes of meetings 	That stakeholder influence, needs and requirements may be altered or changed throughout project stages.

Objective	Name of deliverable	Information sources	Research method	Tools	Restrictions
12. To explain, using regenerative and sustainable development, the relationship and impact of the project execution and operation of the final product to establish which effects of the end results favor or disfavor regenerative or sustainable development.	Explanation and analysis of project execution and favor or dis favor of end results using regenerative and sustainable development	<p>Primary:</p> <p>Personal meetings with key stakeholders from C.A.R.E , TVET, ILO, The Project Architect (Department of Physical Development and Urban Renewal) and the Ministry of Education</p> <p>Secondary:</p> <p>Book: Regenerative development, the way forward to saving our civilization, Internet, journal articles.</p>	The analytical method will be employed together with the use of the primary and secondary information sources identified in Chart 1 to conduct an analysis using regenerative and Sustainable development to establish favorable or unfavorable end results to regenerative and Sustainable development	<ul style="list-style-type: none"> • Research data analysis • Internet 	That information needed to conduct the assessment is available to complete this section within one week.

22. Validation of the work in the field of regenerative and sustainable development.

The P5 Ontology

The main purpose of the P5 is to identify potential impacts to sustainability, both positive and negative, that can be analyzed and presented to management to support informed decisions and effective resource allocation. The P5 Standard supports the alignment of projects with organizational goals for sustainability by focusing on the potential impacts of the project's activities, results, and outcomes.

The ontology is a set of concepts and categories in a subject area that shows their properties and the relationships among them. It also helps to manage complexity by organizing the available information in a coherent way. The P5 ontology uses the triple bottom line of People, Planet, and Prosperity by adding consideration of Product and Processes impacts (GPM®, 2019)

Hence the Design and Construction of the Center for Adolescent Renewal and Education project will obtain compliance with the concepts of regenerative and sustainable development through the application of the P5 Methodology of Product, Process, People, Planet, and Prosperity to the design and construction of the Center for Adolescent Renewal and Education (C.A.R.E.) project.

According to The P5 Impact Analysis results for the

- Product and Processes averaged 3.8
- People averaged 3.1
- Planet averaged 2.6
- Prosperity averaged 2.7

This is a strong indication that the projected outcomes of the project favor regenerative and sustainable development and that the project is on track to contributing positively to improving the environmental impact of its coming into being.

According to (GPM®, 2019) The guideline to interpreting the P5 Impact Analysis Template is as follows:

5 = Strongly agree 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly disagree

Strongly agree means that this impact will improve the project's outcome(s) from a sustainability perspective.

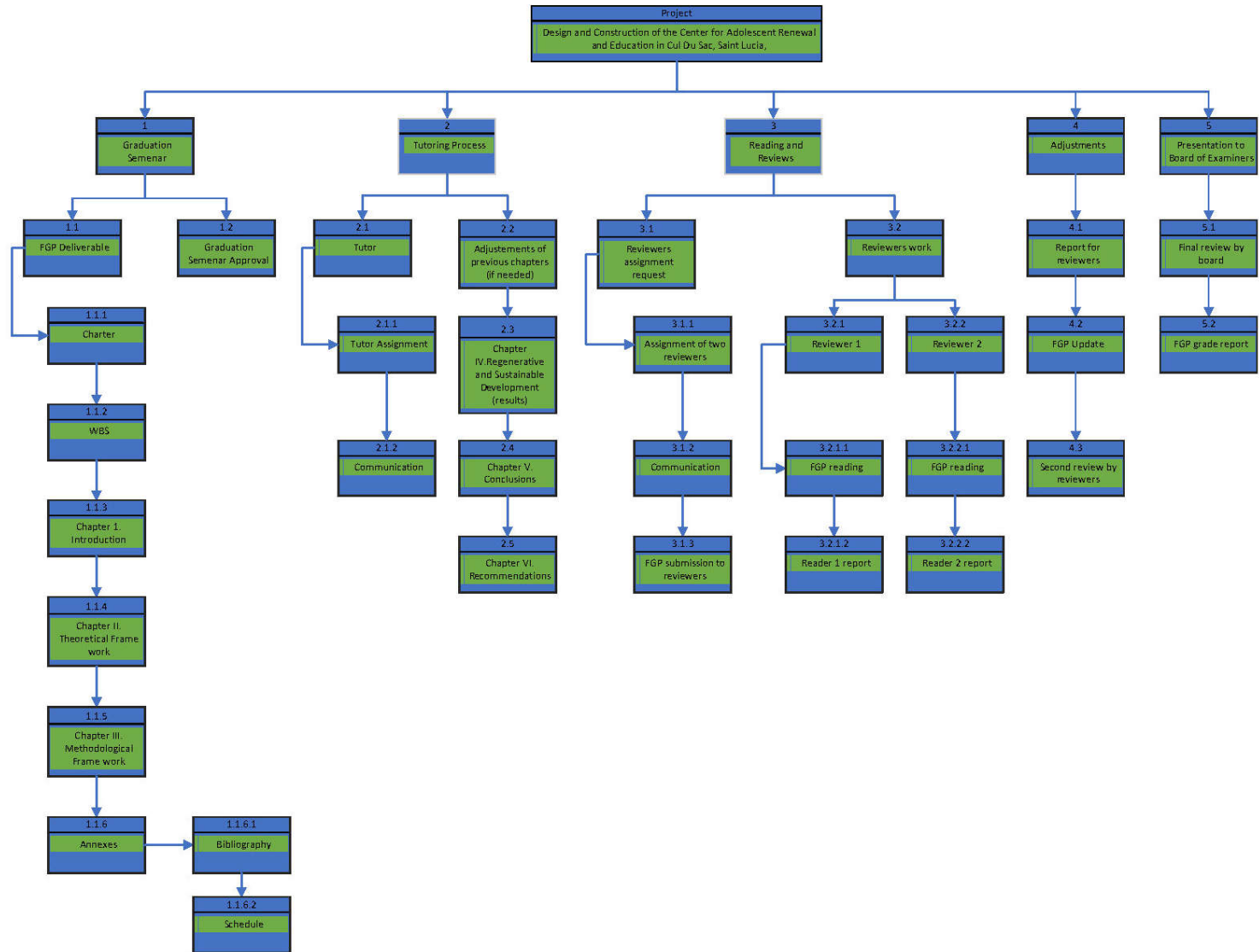
Neutral means that this impact is not expected to affect the project's outcome(s) from a sustainability perspective.

Strongly disagree means that this impact will worsen the project's outcome(s) from a sustainability perspective.

Appendix 2: Project Development WBS

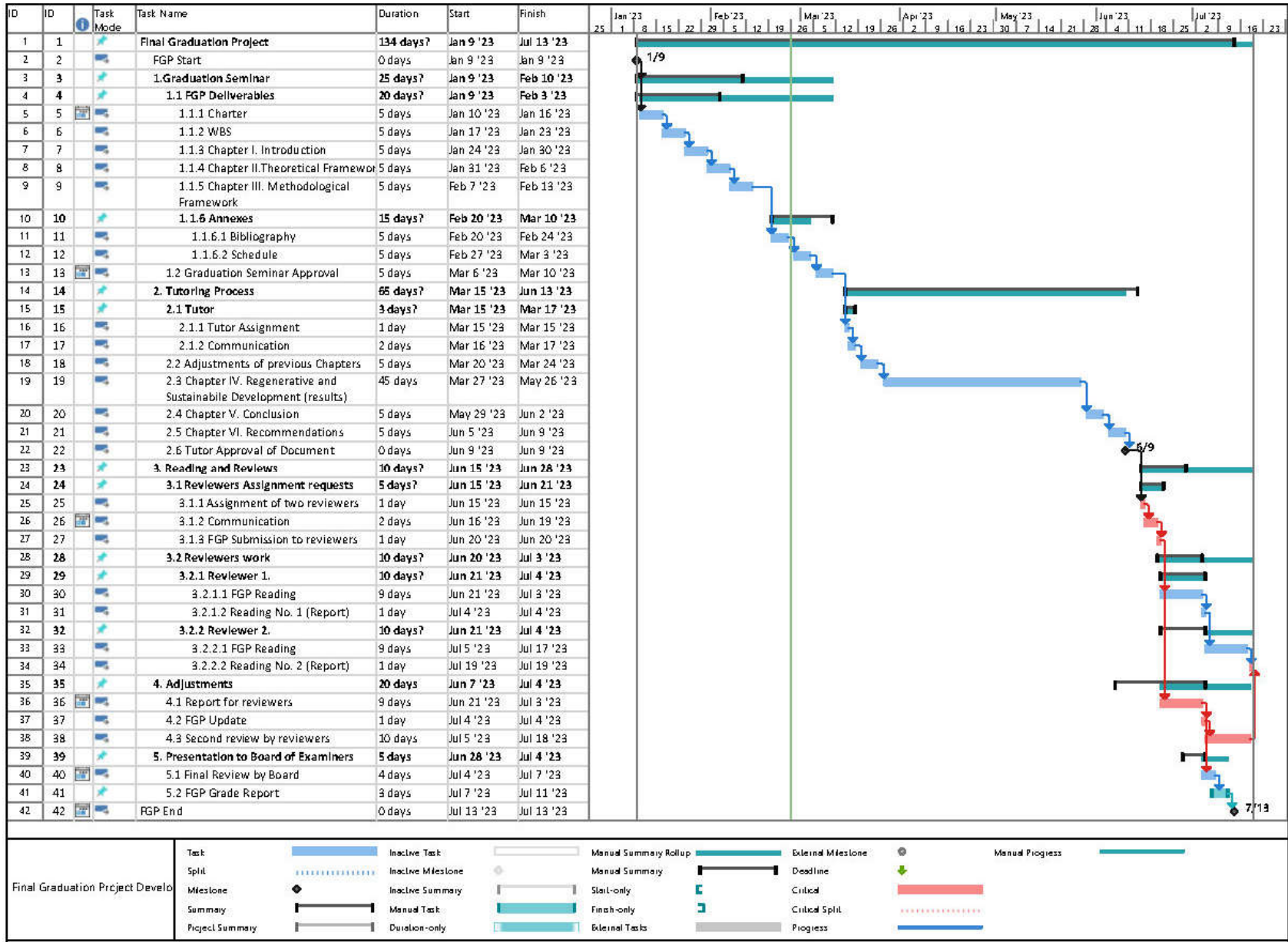
Figure 32 Project Development WBS (Source: Georges, L.B., Author,

February 2023)



Appendix 3: Project Development Schedule

Figure 33 Project Development Schedule (Source: Georges, L.B., Author, February 2023)



Appendix 4: Preliminary bibliographical research

Asian Development Bank, (2021). Strategic Procurement Planning -Guidance note on Procurement. Retrieved from:

<https://www.adb.org/sites/default/files/procurement-planning.pdf>

Reason:

I see this book as being instrumental in efforts providing a summary of strategic procurement planning activities especially from a sustainable point of view. It gives a general overview of the operating environment, project concept, market analysis etc. and also provides samples of templates for the various procurement assessment processes. I see this as a vital contributor to the development of my research project.

Centre for Adolescent Renewal & Education (C.A.R.E). Facebook. (n.d.). Retrieved from:

<https://www.facebook.com/Centre-For-Adolescent-Renewal-Education-CARE121361101251756/>

Reason:

This Web page, in addition to Physical documents, Gives a brief understanding of the roles of the organization in the institutional development of the country's adolescents.

Cohen, E. (2022). The Project Management Lifecycle: Every Phase & Step to Follow. Retrieved from:

<https://www.workamajig.com/blog/project-life-cycle>

Reason:

The article provides clear and concise explanations of the life cycle phases and graphically demonstrates explanations, hence creating improved understanding of the relevant concepts for application in the research project.

Gresham, J. (2016). John staff Strategic Projects - Project Management Plan for the Lower Solukhumbu Education Rebuild and Recovery Project. Retrieved from:

https://www.australianhimalayanfoundation.org.au/wp-content/uploads/2017/08/Iserr_proj_man_2016.pdf

Reason:

Assist in providing clarity on the project management process in construction of an educational facility and what should be the strategic approach to project of this nature. This bibliography is included because it gives a clear and structured indication and construction process.

New Zealand Government Procurement, (2022). Construction Sector Accord- COVID-19 Construction Risk Management - A recommended approach to COVID-19 commercial principles and risk management, Retrieved from:

<https://www.constructionaccord.nz/assets/Construction-Accord/files/covid-19-construction-risk-management.pdf>

Reason:

I found it fitting that due to the Covid-19 pandemic, managing a staff count of 18 to 20 person and having to develop procedures for continuity of work, on a daily basis (rotation and work Schedules to adhere to protocols) we were forced to develop systems and mechanisms that encouraged continuity of work. It is therefore essential that I take into consideration the possibility of the occurrence of other pandemics or similar health related scenarios that would have an effect on our livelihoods and assure that the project management plan takes such into consideration.

Parlak Biçer, Zübeyde & Taner, Zafer Tarık & Kuruköse, Hatice & Öztürk, Penbegül. (2020). CONSTRUCTION PROJECT MANAGEMENT PROBLEMS AND SOLUTION PROPOSALS OF EDUCATION BUILDINGS. Retrieved from:

https://www.researchgate.net/publication/340162978_CONSTRUCTION_PROJECT_MANAGEMENT_PROBLEMS_AND_SOLUTION_PROPOSALS_OF_EDUCATION_BUILDINGS

Reason:

This article is important as it is associated with identifying the problems associated with construction of educational buildings independent of the zoning and offers solution to these problems. This research project is located in a zone that may present many problems during and after construction and hence I see it fitting the present article to offer guidance on pros and cons and also solutions derived to achieve project success.

Project Management Institute. (2017). A Guide to the Project Management Body of Knowledge, (PMBOK® Guide) - Sixth Edition, Project Management Institute, Inc., 2017.

Reason:

PMBOK clearly defines the project management stages and will assist in providing direction for the research project.

Saint Lucia Public Procurement and Asset Disposal Act- No.19, (2015)

Reason:

The Procurement and Asset Disposal Act is also essential to mapping various stages of the procurement processes and templates etc. to the regulatory regimes of Saint Lucia.

Saint Lucia Physical Planning and Development Act. (2005). Revised edition

Reason:

The Saint Lucia Physical Planning and Development Act is essential to mapping various stages of the procurement processes and templates etc. to the regulatory regimes of Saint Lucia. This is the Last updated version that exists. No further updates have been realized to date.

Soo Din, N. (2016). Construction Procurement- Module No: UBLM78-15-M Retrieved from:

https://www.academia.edu/33683475/CONSTRUCTION_PROCUREMENT?email_work_card=view-paper

Reason:

Gives clarity on procurement method, the management framework, risk and patterning aligned to building construction. Will assist in directing the development of the Project Management Plan.

Appendix 5: Other relevant information

Bibliographical research

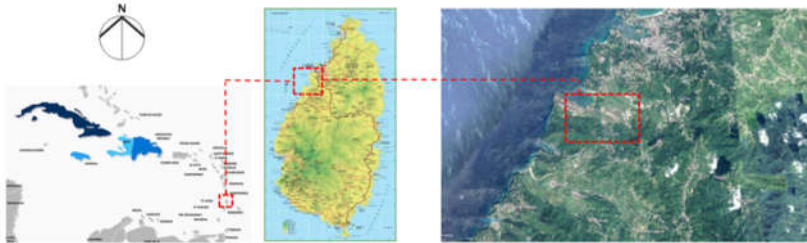
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[https://hrmars.com/papers_submitted/6706/Exploring_the_Learning_Theories_Underpinning_in_Technical_Vocational_Education_and_Training_\(TVET\)_Curriculum_Perceived_by_TVET_Students.pdf](https://hrmars.com/papers_submitted/6706/Exploring_the_Learning_Theories_Underpinning_in_Technical_Vocational_Education_and_Training_(TVET)_Curriculum_Perceived_by_TVET_Students.pdf)
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<https://www.scribbr.com/methodology/quantitative-research/>
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care_admin. (2020, August 18). *History*. Retrieved from Centre For Adolescent Renewal & Education (C.A.R.E): <https://care.edu.lc/history/>
- Dictionary, O. (2023). *Oxford Dictionary*. United Kingdom.
- Dictionary, O. A. (2023). *Oxford Learner's Dictionaries*. Retrieved from oxfordlearnersdictionaries.com:
https://www.oxfordlearnersdictionaries.com/definition/english/source_1
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<https://www.dictionary.com/browse/information>
- Gabel, M. (2015-2020). *Regenerative Development: Going beyond Sustainability*. *New Community*. Retrieved from <https://www.kosmosjournal.org/article/regenerative-development-going-beyond-sustainability/>
- Goodrich, B. (2018). *PM Learning Solutions-Assumption vs Constraints*. Retrieved from pmlarningsolutions.com: <https://www.pmlarningsolutions.com/blog/assumptions-versus-constraints-pmp-concept-9>
- GPM®, G. (2019). The GPM P5™ Standard for Version 2.0. In G. Global, *The GPM P5™ Standard for Version 2.0* (p. 41).
- Hassan, M. (2022). *Methodological Framework – Examples, Guide*. Retrieved from ResearchMethods.net: <https://researchmethod.net/methodological-framework/#sidr-main>
- Lucia, G. o. (2020). *Public Procurement and Asset Disposal (Amendment) Act*. In G. o. Lucia, *Public Procurement and Asset Disposal (Amendment) Act*. Castries.
- Management, A. I. (2021, August 10). *AIPM*. Retrieved from aipm.com.au:
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Appendix 6: Feasibility Study, Concept, Schematic Proposal

3.0 SITE LOCATION

Saint Lucia is an island state in the Caribbean Sea. It is the second largest of the Windward group in the Lesser Antilles and is located about 24 miles (39 km) south of Martinique and some 21 miles (34 km) northeast of Saint Vincent. The capital and major port is Castries. The proposed site is located at Cul De Sac which falls in the quarter of Castries on a parcel of land registered as block and parcel 06448 147. The general area was once a predominantly farming district but has seen an increase in industrial and commercial activities over the recent years. However, a vast portion of the surrounding lands remain unbuilt.



4.1.3 MACRO SITE – LANDUSE

The existing land use pattern for the Cul De Sac region is of mixed use ranging from residential, commercial, industrial, institutional and also recreational use. In recent years the entire basin was predominantly and intensively occupied by farm land which was a major source of income for the residence.

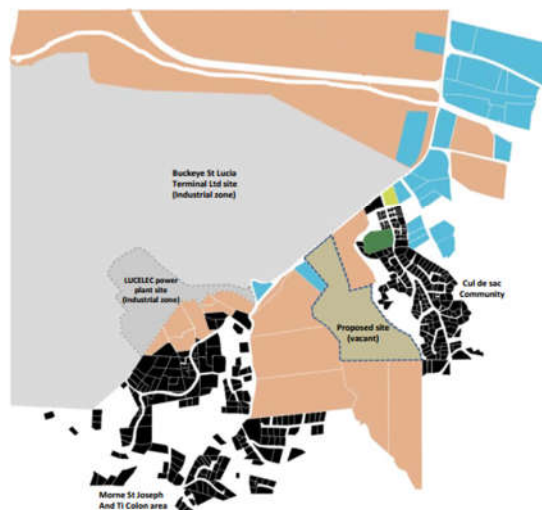


Photo of Buckeye St Lucia terminal Ltd on opposite parcel of land to proposed site



Photo of vacant and commercial activity in background

April 21



- LEGEND:
- Commercial activities
 - Residential areas
 - Institutional – Daycare center
 - Recreational – playing field
 - Vacant undeveloped lands



Photo of vacant undeveloped land along the Millennium Highway



Photo of commercial activity along west coast road

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5.1 FLOODING

The Cul De Sac basin is well known to be vulnerable to the natural hazard of flooding and the community has been immensely impacted over the years. Cul De Sac is surrounded by hilly topography with areas such as Morne Fortune, Morne St Joseph, TI Colon, Marc and Bezon which are major contributors of run off or surface water resulting in constant flash floods even after minor rainfall. Even with persistent heavy rainfall, the project site is not likely to be directly impacted by excess water from the main Cul De Sac river. However, it is constantly inundated due to an existing watercourse (dry ravine) which runs along the site and connects to the main road side drain. In addition, due to the nature and topography of the project site, run off water from the elevated parts would contribute to the settlement of water at the lower areas of the site. The following observations were made during the first site visit:

- The road side drain which runs along the west coast road and the project site had a minimum flow of water even in the absence of any rainfall.
- An existing concrete drain as an effort to reduce the volume of water on the project site
- Water settlements at the base of elevated areas.

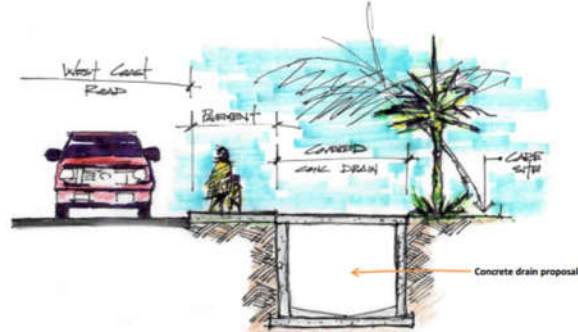


Flooding along the Cul De Sac main road (West coast road) near project site

Run off water from mountain ridge
Causing flooding along the west coast road near project site



St. Lucia Flash/flood hazard map from CDEMA (Caribbean Disaster Emergency Management Agency) website - CHARIM Project



Proposed drainage option for main drain along west coast road and project site - concrete drain and slab covering

THE CONCEPT

CONCEPT - An abstract idea / a plan or intention / and idea to help sell a project or commodity.

The Architectural concept for this project was driven by analyzing 2 key points which were the use of the end user requirement document (project brief) and secondly the site analysis. The end user requirement played a dominant role in developing this concept notwithstanding the fact that it provided the relevant guidelines and general specifications for accommodation, relationship of spaces, areas and calculations. With the use of the document, the analysis went as far as generating a storyline based on the final end users of the CARE facility which boiled down the student. Key words such as "marginalized" and "targeted age" assisted with this narrative.

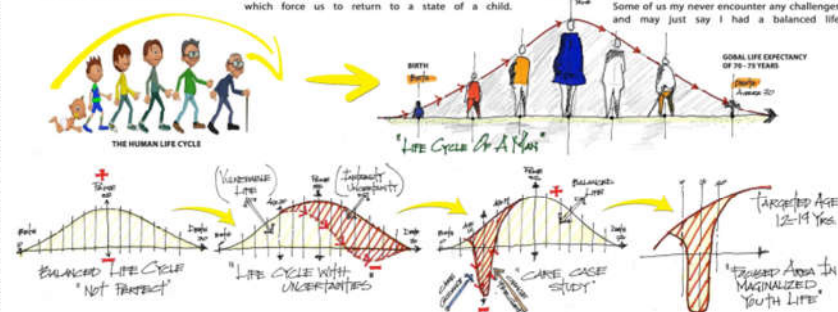
The site analysis was the initial start of the process and it took into consideration the features, constraints, characteristics which may impact the design process. Most of these components formed part of the site analysis section of the feasibility study document.

1. THE CLIENT'S BRIEF

"THE SOFTER SIDE OF THINGS"

One man twice a child is the theory of retrogenesis which simply means that we were as a child the grow into an adult and we age the begin to lose our abilities which force us to return to a state of a child.

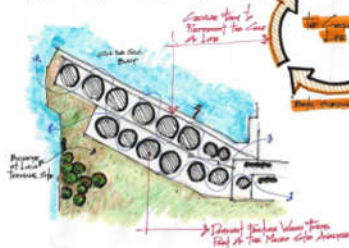
But as we age we live our lives, we encounter different experiences. Some good and some bad. Some at an early stage and some later on in life. Some of us my never encounter any challenges and may just say I had a balanced life



2. THE CONTEXT

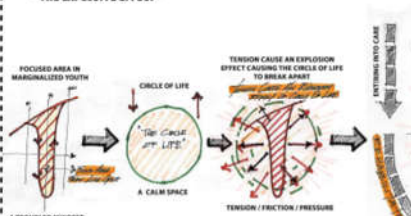
"CLEAR, VISIBLE AND WELL-DEFINED"

One of the most dominant features which forms part of the site analysis were a series of massive crude oil storage tanks which sits along the Cul De Sac Bay. There was no better expression to relate these dominant forms as the circle of life or rather "the circles of life".

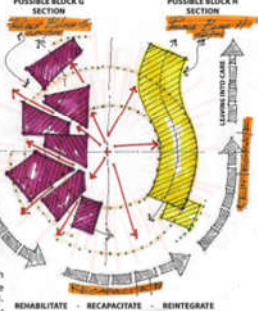


3. THE IMPACT

"THE EXPLOSIVE EFFECT"



Introducing a troubled mindset into a calm space will no doubt be encountered with some form of resistance. Eventually when the pressure applied is too much then the circle of life will break leaving only fragments of what was once so defined. The after effects of the impact clearly convey that an individual comes in broken, gets the required skill set and leaves as a whole. Eventually, gets reintegrated into society and enjoys life.

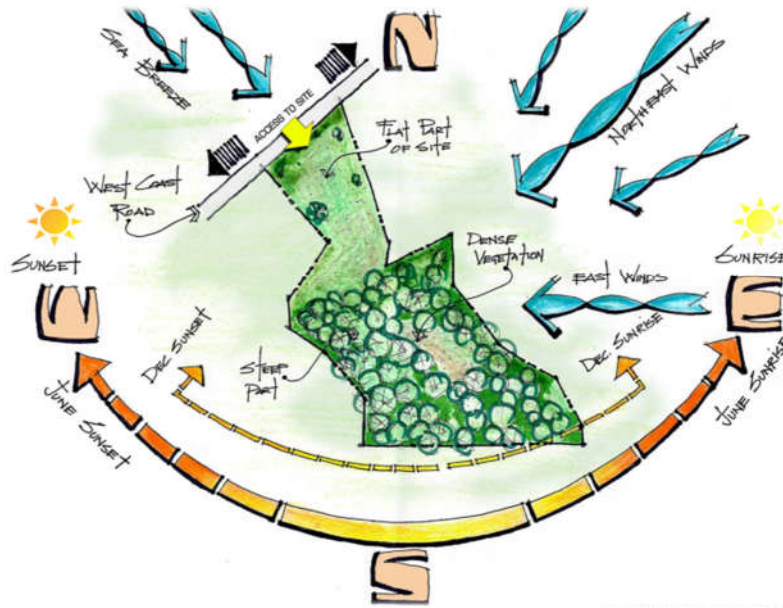


4.2.2 MICRO SITE SOLAR AND WIND PATTERNS

The solar site pattern as indicate below takes in the consideration the movements of the sun at highest and the lowest periods. Longer days are expected when the sun is at it highest which normally occur during mid year (June). The higher the solar path, the less penetrating sunlight is likely to enter an interior space. On the other hand, the lower sun would result in shorter day which occurs end of year to early year (Dec - Mar). The lower the sun path is, the more sunlight would enter an interior space.

The wind patterns are identified as the blue arrow pointing from a northeast, east and northwest directions. Due to our geographical location, the prevailing winds comes directly from the Northeast which is famously called the "Northeast Trade Winds". The island also experience wind pressures from the east and also from sea breeze.

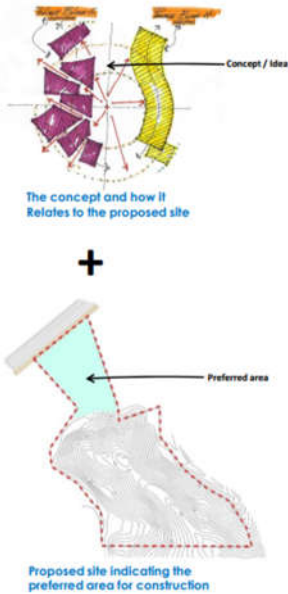
The yellow arrow to indicate the most suitable access to the site which is right off the west coast road. The site could be access via various footpaths through the Cul De Sac community however based on legal documentation these footpaths are not the legal right of way to the site.



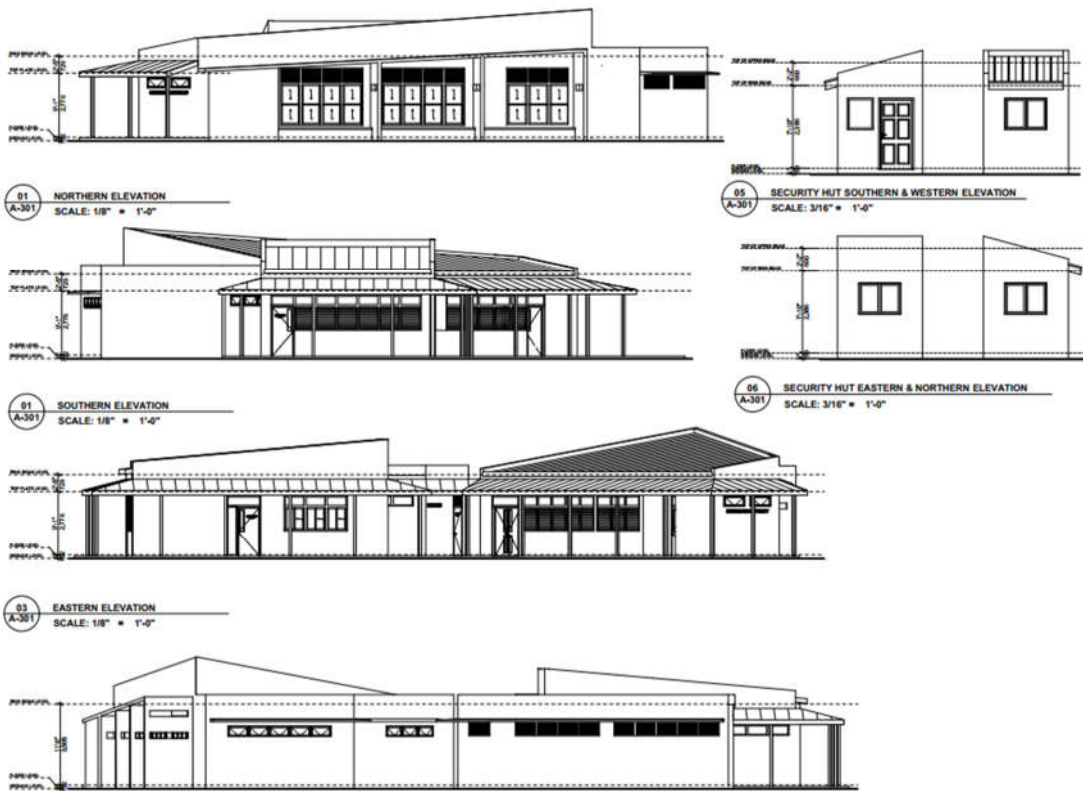
April 21

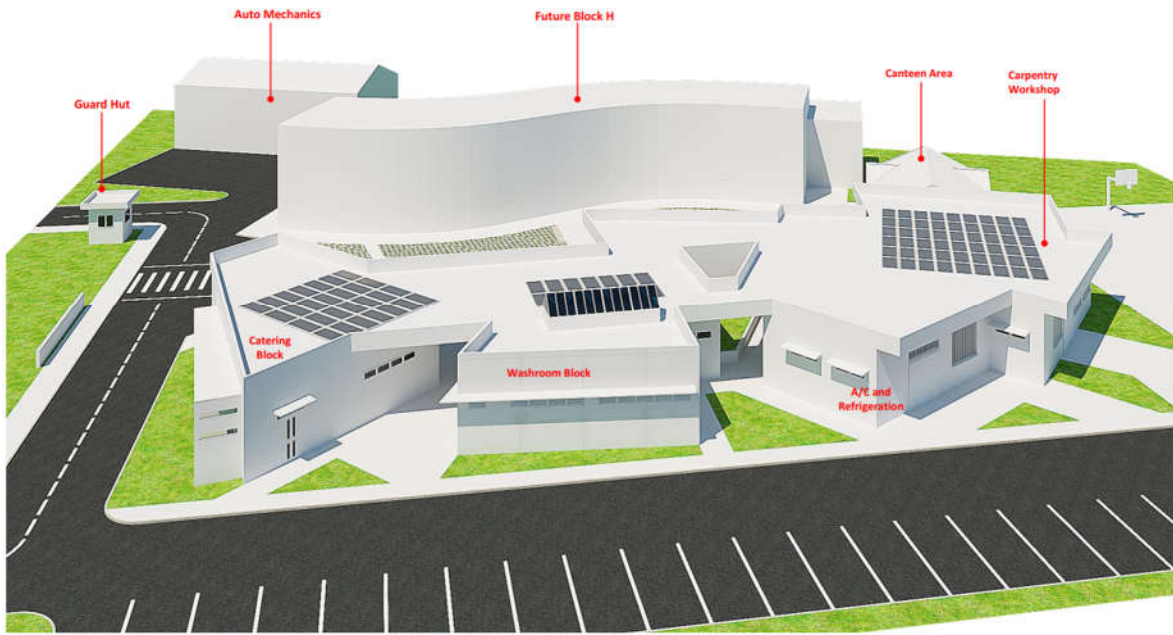
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THE SCHEMATICS



TYPICAL ELEVATION – BLOCK G (single level complete)





Construction Phase



Walls & Rim beams

Walls and Openings



Foundation works.

Appendix 7: Proofreading letter

Elizabeth Biscette
Communication Studies Lecturer
Sir Arthur Lewis Community College
Morne Fortune, Castries
St Lucia

UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL(UCI)

To Whom It May Concern

This is to certify that I (Elizabeth Biscette), holder of a Bachelor of Education in the area of Teaching of the Language Arts and a Postgraduate Diploma in New Literacies have thoroughly reviewed a Final Graduation Project as partial fulfillment of the requirements for a Master's in Project Management (MPM) Degree.

The project entitled: DEVELOPMENT OF A PROJECT MANAGEMENT PLAN FOR THE DESIGN AND CONSTRUCTION OF A CENTER FOR ADOLESCENT RENEWAL AND EDUCATION IN CUL DU SAC, SAINT LUCIA

Was prepared by: LYNDON BARRY GEORGES

During the review, particular attention was paid to the writer's ability to express the ideas in a way that will be understood by an eclectic audience. Hence, the language conventions, namely grammar inclusive of sentence structures and word usage, spelling, punctuation, and general formatting were critical areas that were focused on. Frequent conversations with the writer seeking clarifications on what was required led to suggestions made for revision.

At this point, I am satisfied with the revisions made and declare the project ready for presentation.

Sincerely,



Elizabeth Biscette

Communication Studies Lecturer
Sir Arthur Lewis Community College
St. Lucia