UNIVERSIDAD PARA LA COOPERACIÓN INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN FOR THE CONSTRUCTION OF A SINGLE FAMILY DWELLING FOR HOPEY CONSTRUCTION

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FINAL GRADUATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
MASTER IN PROJECT MANAGEMENT (MPM) DEGREE

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This Final Graduation Project was approved by the University as partial fulfillment of the requirements to opt for the Master in Project Management (MPM) Degree

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DEDICATION

I dedicate this research project to God the source of my strength, to my family, especially my parents Alwyn & Lucinta Mandeville for the installation of great values, and for always supporting me in my endeavors towards personal development, and to Hopey Construction and my father Mr. Alywn Mandeville the muse for my project.

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I wish to express my greatest gratitude to all the people who have helped and supported me in the writing and completion of my final graduation project. I am grateful for the assistance of Mr. Edwards; Coordinator of Adult Education Programme at the Ministry of Education, and Mr. Williams; Building Inspector at the Planning Department.

I am particularly grateful to Mr. Reynold Hope; Owner of Hopey Construction for allowing me to feature his company in my project, and Mr. Alwyn Mandeville; my father, architect and owner of this project.

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For my family and friends who have continually inquired about my project and or gave advice when needed, I thank you.

Most of all, to God of which none of this would be possible without his gift of life and strength so that I would be able to cross the finish line and accomplish my goals, to Him I am forever grateful.

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ABBREVIATIONS AND ACRONYMS

ADU	Accessory Dwelling Unit
CARICOM	Caribbean Community
FGP	Final Graduation Project
GECCU	General Employees Cooperative Credit Union
HLDC	Housing and Land Development Corporation
KCCU	Kingstown Cooperative Credit Union
PMBOK Guide ©	Guide to the Project Management Body of Knowledge
PMI	Project Management Institute
RACI	Responsibility Assignment Matrix
RBS	Risk Breakdown Structure
SVG TCCU	St. Vincent Teachers Cooperative Credit Union
UCI	Universidad Para La Cooperacion Internacional
WBS	Work Breakdown Structure
XCD	Eastern Caribbean Dollar

EXECUTIVE SUMMARY (ABSTRACT)

The housing market in St. Vincent and the Grenadines is continuously growing, principally on account of the housing revolution where the number of households has improved by more than 20%, and an average person per household count has declined primarily as a result of an augmentation in new housing and home expansions across the country leading to quality housing. The Housing and Land development Corporation (HLDC) exclusively has constructed over 677 homes since the year 2002. In connection with these spurs in construction is also relative to strong competition in the construction industry.

Hopey construction is a construction company predominantly involved in residential and commercial construction. In addition to building construction, the company manufactures building materials for consumption both internally or on company hired projects and externally; for sale to other construction companies. The company uses a traditional approach to planning and managing projects, where only documentation that is required is provided if necessary. With the absence of a standardized approach to planning has developed several issues relevant to time, cost and scope. The purpose of the research project, however small in magnitude was to seek to implement another alternative to planning projects based on PMI best practices, and sustainable practices to improve current practices and effectively manage projects.

The Final Graduation Project general objective was To create a project management plan for the construction of a single family dwelling for Mr. Alwyn and family in order to guide the how the project will be managed and controlled through the implementation of PMI's best practices. The specific objectives were: objective 1 to create a project charter to formally authorize the project and to give the project manager the authority to apply organizational resources to the project resources, objective 2 to create a scope management plan to ensure that all required project work is incorporated in order to successfully complete the project, objective 3 to create a schedule management plan to guide the project schedule to ensure a timely delivery of the project deliverables, objective 4 to create a cost management plan to plan how cost relating to the project will be managed in order to avoid budget overrun, objective 5 to create a quality management plan to achieve the acquired standard necessary for a successful project delivery, objective 6 to create a human resource management plan to determine the staffing requirements during the life of the project, objective 7 to create a communications management plan to foster inefficient and effective communication between the client and the company, objective 8 to create a risk management plan that will describe how project risks will be managed and controlled in order to avoid project schedule delays and costs overrun, objective 9 to create a procurement management plan that will act as a guideline to manage procurements throughout the life of the project and objective 10 to create a stakeholder management plan to develop the stakeholder register in order to identify and help to engage the key stakeholders.

The methodological approach used for this research is both a quantitative and analytical research method using PMBOK Guide© 5th Edition as a guide to provide comprehensive planning and documentation for the construction of the single-family dwelling apartment on Hopey's construction behalf. Information was obtained through amalgamation of interviews and historical data to develop the Final Graduation Project, in addition to templates provided for the purpose of this research.

The development of this project revealed that having fulfilled the general and specific objectives aforesaid, that the construction management planning measures undertaken by the company were inadequate in relation to Project Management Institute best practices and pinpointed loopholes in current practices that did not facilitate more favorable delivery of all company projects considering the construction industry climate in St. Vincent and the Grenadines. Through the use of the prescribed subsidiary plans and in general proper planning and documentation of projects will aid in the company in effectively managing future projects and assist in proper management of company endeavors.

It is recommended that the company make investments towards a more validated approach to planning projects in order to trigger a higher rate of project success through the use of tools such of templates for the creation of plans, additional personnel to implement best practices and company standards and or policies to foster continuity etc.

1 INTRODUCTION

1.1. Background

Hopey Construction is a construction company founded by Mr. Reynold Hope who has been involved in the construction business for more than 40 years in residential and commercial construction. The company is also a producer of building materials such as building blocks, concrete balusters and columns. The construction company is based in St. Vincent and the Grenadines in Belair, which is located on the windward side of mainland St. Vincent. The company currently has a staff of over 18 permanent tradesmen in addition to a few temporary laborers on a standby basis of various skillset. The goal of the company is to provide a quality product and service, to satisfy the needs of its customers and to help improve the livelihood of its clients. Notably the company has also been efficient in the treatment of waste by recycling materials on other projects and donating selected materials.

Albeit the years of service in the construction sector, Hopey construction has used a traditional approach to planning and managing projects where only the documentation that is necessary for the construction is provided, if any. Here, the contractor is proactive in the construction process and contributes to the designing process.

The major challenge that the company encounters is continual scope changes by the client, which results in budget-overrun and extension in project schedule. Taking into account the current situation, this project will employ PMI best project management practices to demonstrate how projects can be better planned and managed, increase the success of projects, improve the quality of projects and improve existing sustainable practices employed by the company.

As apart of the initiation process for the project, Mr. Alwyn an architect by profession, and a retired building inspector at the St. Vincent and the Grenadines Physical Planning and Development Unit with 32 years of experience, drafted the plans necessary to proceed with the project. The necessary steps to gain planning approval from the aforementioned departmental board in accordance with the St. Vincent and the Grenadines Building Guidelines were followed and the relevant application filed to build was permitted.

This project will feature the construction a Single Family Dwelling otherwise referred to as an Accessory Dwelling Unit (ADU) featuring a 1-½ story apartment that will act as a rented accommodation. The apartment will be built on the lower section of a 10,000 sq. ft. plot of land consisting of a preexisting house taking up 2,500 sq. ft. of the land and located on the upper half of the property. The proposed residential rental property will seek to secure a future regular monthly income stream apart from the family's current employment contracts and retirement packages. The demographic that the family hopes to attract are foreign medical students interested in short-term rentals following the influx in medical students traveling to the island to pursue studies in medicine on account of the reinstatement and establishment of medical universities in St. Vincent and the Grenadines and the hopes in supplying the need for safe and secure housing for the students.

1.2. Statement of the problem

Due to the lack of a standardized approach to planning by the company, it has resulted in scope changes, which further resulted in extensions to project schedule and budget-overrun. The company has had instances where the client was unable to fulfill financial obligations to increased

changes and demands. There is a need to properly plan projects to increase project success rate, improve quality and employ more sustainable practices. The project management plan will seek to guide project delivery through implementation of PMI's best project management practices.

1.3. Purpose

The purpose of this project management plan is to develop and to present a better alternative to the traditional approach of managing projects through the use of good project management practices to derive successful delivery of project deliverables and increasing the success rate of the construction company. This plan will seek to gain a better knowledge on how to manage projects through formal documentation of the project scope and deliverables, and detailing how the project will be executed, monitored and controlled. It could also be used as a contractual agreement and facilitate proper change control procedures and facilitate the delivery of projects on schedule and budget.

1.4. General objective

To create a project management plan for the construction of a single family dwelling for Mr. Alwyn and family in order to guide the how the project will be managed and controlled through the implementation of PMI's best practices.

1.5. Specific objectives

1. To create a project charter to formally authorize the project and to give the project manager the authority to apply organizational resources to the project resources.
2. To create a scope management plan to ensure that all required project work is incorporated in order to successfully complete the project.
3. To create a schedule management plan to guide the project schedule to ensure a timely delivery of the project deliverables.
4. To create a cost management plan to plan how cost relating to the project will be managed in order to avoid budget overrun.
5. To create a quality management plan to achieve the acquired standard necessary for a successful project delivery.
6. To create a human resource management plan to determine the staffing requirements during the life of the project.
7. To create a communications management plan to foster inefficient and effective communication between the client and the company.
8. To create a risk management plan that will describe how project risks will be managed and controlled in order to avoid project schedule delays and costs overrun.
9. To create a procurement management plan that will act as a guideline to manage procurements throughout the life of the project.
10. To create a stakeholder management plan to develop the stakeholder register in order to identify and help to engage the key stakeholders.

2 THEORETICAL FRAMEWORK

2.1 Company/Enterprise framework

The company framework will provide an overview of the company, how they conduct business in light of projects, an outline of its goals, give insight into its organization structure and the products and or services offered by the company.

2.1.1 Company/Enterprise background

Mr. Reynold Hope an entrepreneur and the founder of Hopey construction has been involved in the construction industry since the age of 16 culminating to more than 40 years of experience. The company has a reputation of delivering impeccable service throughout its years of existence, providing construction services to an extensive range of clients both in residential and commercial construction throughout St. Vincent and the Grenadines. The company specializes in building renovations, additions, construction of new buildings and the manufacturing and supplying of selected building components, and often juggles multiple construction projects at one time. The company has also played its part in empowering young men by affording them opportunities to work within his business especially in cases where these youths have been inept to pursue continual educational in school. He personally trains his laborers who are able to learn and develop their skills, most of who remain loyal to the company and dedicated to the work, and others are able to move on to other opportunities that may present themselves. The company's customer approach features a collaborative partnership between the builder, the architects and the clients. Mr. Reynold Hope often has a hands-on and proactive approach regarding the job to be executed, his workers and catering to the needs of the client. (R. Hope, personal communication, July 9, 2017)

2.1.2 Mission and vision statements

Hopey Construction's mission is, to provide builder services that seek to exceed the expectations of its clients whilst providing construction solutions at affordable prices and of the best quality in order to satisfy the customer's needs and contribute to a better standard of living for members of the community and country as a whole. (R. Hope, personal communication, July 9, 2017)

Hopey Construction's vision is to, provide an environment that fosters growth and development of the employees and to stand out amongst its competitors in providing quality construction services and materials. (R. Hope, personal communication, July 9, 2017)

2.1.3 Organizational structure

The organizational structure is defined as "an enterprise environmental factor, which can affect the availability of resources and influence how projects are conducted.

Hopey Construction is a relatively small company and family operated. As depicted in the organizational structure of the company in *figure 1* below, the owner plays the role of the construction manager, he is involved in some cases during the design phase of the projects and work along with the architect as in the case of this project, the construction of the single family dwelling. In majority of instances however, he comes on board or is contracted only after the plans have been drawn and permits have been approved. The company has an administrative assistant responsible for paying out wages and taking care of minor matters relevant to business operations, whereas the managing of the employees both the manufacturing and construction team, and the project is of the sole responsibility of the owner/ construction manager.

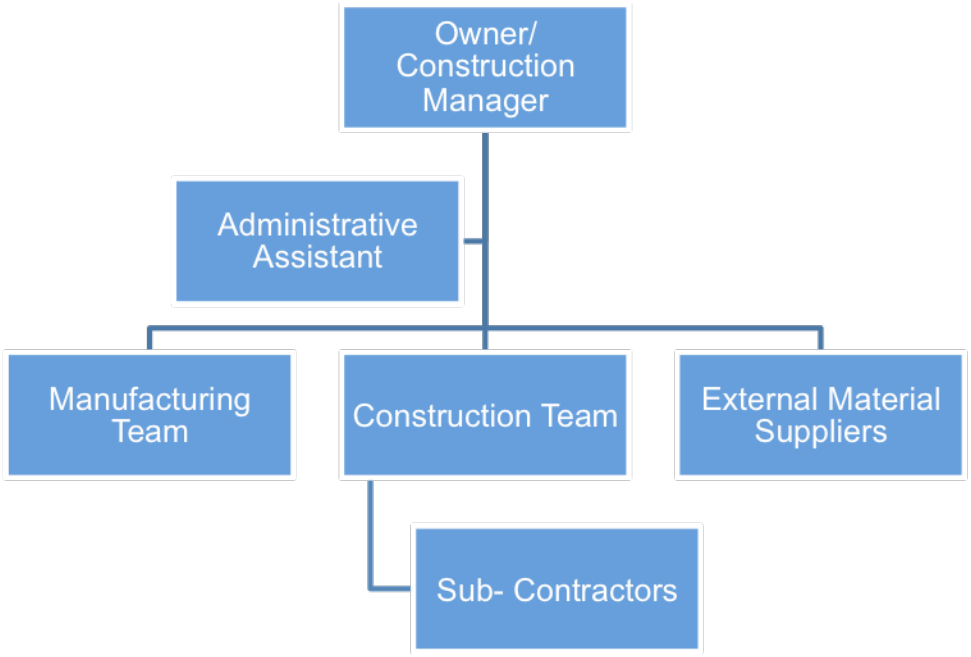


Figure 1. Organizational Structure (Source: personal communication, July 9, 2017)

2.1.4 Products offered

The products and services offered by Hopey Construction are commercial construction, residential construction, renovations/ remodeling, electrical services, painting, plumbing, roofing, repairs/ reinforcements, estimation services, masonry work, metal work, carpentry, trucking services including delivery of products sold, manufacturing of building materials such as balusters, concrete blocks, and concrete columns. (R. Hope, personal communication, July 9, 2017)

2.2 Project Management Concepts

2.2.1 Project

A project is defined as, “a temporary endeavor undertaken to create a unique product, service, or result” (Project Management Institute, 2013, pg. 3). Turner (as cited in Burke, 2003) further explains that a project is:

> An endeavor in which human, (or machine), material and financial resources are organized in the novel way to undertake a unique scope of work of given specification within constraints of cost and time, so as to deliver beneficial change defined by quantitative and qualitative objectives. (p. 2)

As it relates to the final graduation project (FGP), the project management plan is being developed for construction project for a single-family dwelling apartment. This project as illustrated by the aforementioned definitions of a project will have a definite start and ending time in addition to defined resources and scope.

2.2.2 Project management

According to A Guide to the Project Management Body of Knowledge (PMBOK Guide©) 5th edition, it terms project management as “the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements” (Project Management Institute, 2013, p. 5). Rory Burke (as cited in Higgins, 2009) describes “project management can… be defined as a way of developing structure in a complex project, where the independent variables of time, cost, resources and human behaviour come together” (slide 14).

The purpose of the project being initiated is to as indicated by Project Management Institute (PMI) to meet project requirements which translates to the

requirements that are established by the stakeholder, and how the development of the project will seek to satisfy their needs and meet their expectations.

As the deliverable is associated with a construction project, it facilitates the combined use of construction project management. Wikipedia defines construction project management (as cited in 3rd Forum ”International Construction Project Management”, 2003) “is a professional service that uses specialized, project management techniques to oversee the planning, design, and construction of a project, from its beginning to its end. The purpose of CM is to control a project's time, cost and quality” (“Construction management,” n.d., para.1)

The construction company has no official project management structure as previously indicated. The creation of this final graduation project will present a better alternative managing projects based on PMI’s best practices for projects.

2.2.3 Project life cycle

“A project life cycle is the series of phases that a project passes through from initiation to closure” (Project Management Institute, 2013, p. 38). The project life cycle is used as a framework for subdividing the project into manageable phases making it easier for the project to be managed, controlled and monitor throughout the project’s its lifetime.

As shown in *figure 2*, the project life cycle phases depicted is similar to the stages that a project will pass through in Hopey’s construction company. Initiation phase or the conceptualization phase is the first phase of the project, where the need of the project is established based on the realization of a problem or opportunity and a feasibility study is done to ascertain if the project is worth pursing, the project charter is developed, drawings are approved, permits

granted. As it relates to the FGP, the desire to construct an apartment came from a new to generate a new revenue stream for the client, and for the company there was a need to explore a better alternative to the traditional approach in managing projects to increase project success and to limit and address scope issues. Planning phase or project development phase is the second stage of the project where the scope of the project is defined, its objectives are established, in addition to what is required (budget, resources, schedules etc.) to attain project success. In the case of the FGP, the project management plan will be developed to facilitate the organization and preparation of the project. Execution phase or implementation phase follows as the third stage, where the project work is performed to attain the desired results based on project requirements. The final phase, closing out describes the handing over of the project deliverables to be approved by the project sponsor or client. For the FGP, the project will not explore the later two phases as attention is being paid to the preparation of the project work through already established PMI practices or guidelines.

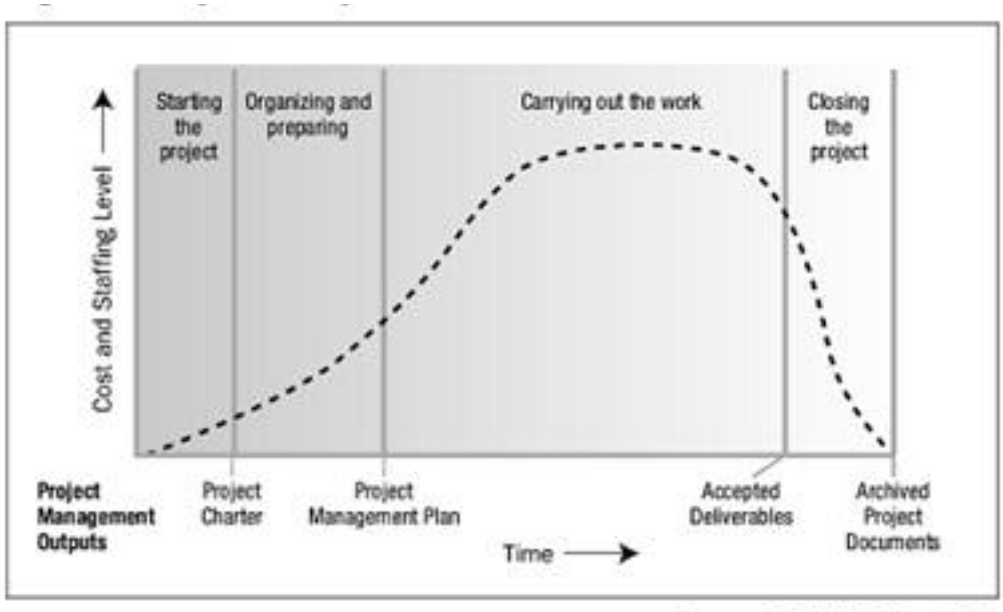


Figure 2. Project Life Cycle (Source: Project Management Institute, 2013, p.39)

2.2.4 Project management processes

According to PMBOK Guide© 5th edition, the project management process group is “a logical grouping of project management inputs, tools and techniques, and outputs.” They are linked by specific inputs and outputs where the result or outcome of one process becomes the input to another process…” (Project Management Institute, 2013, p.554, 52), shown in *figure 4*. As depicted in *figure 4*, there are 47 project management processes translated into 5 project management process groups. Only the project management processes that relates to the imitating and planning process groups will be covered for the conceptualization of the project management plan for the final graduation project.

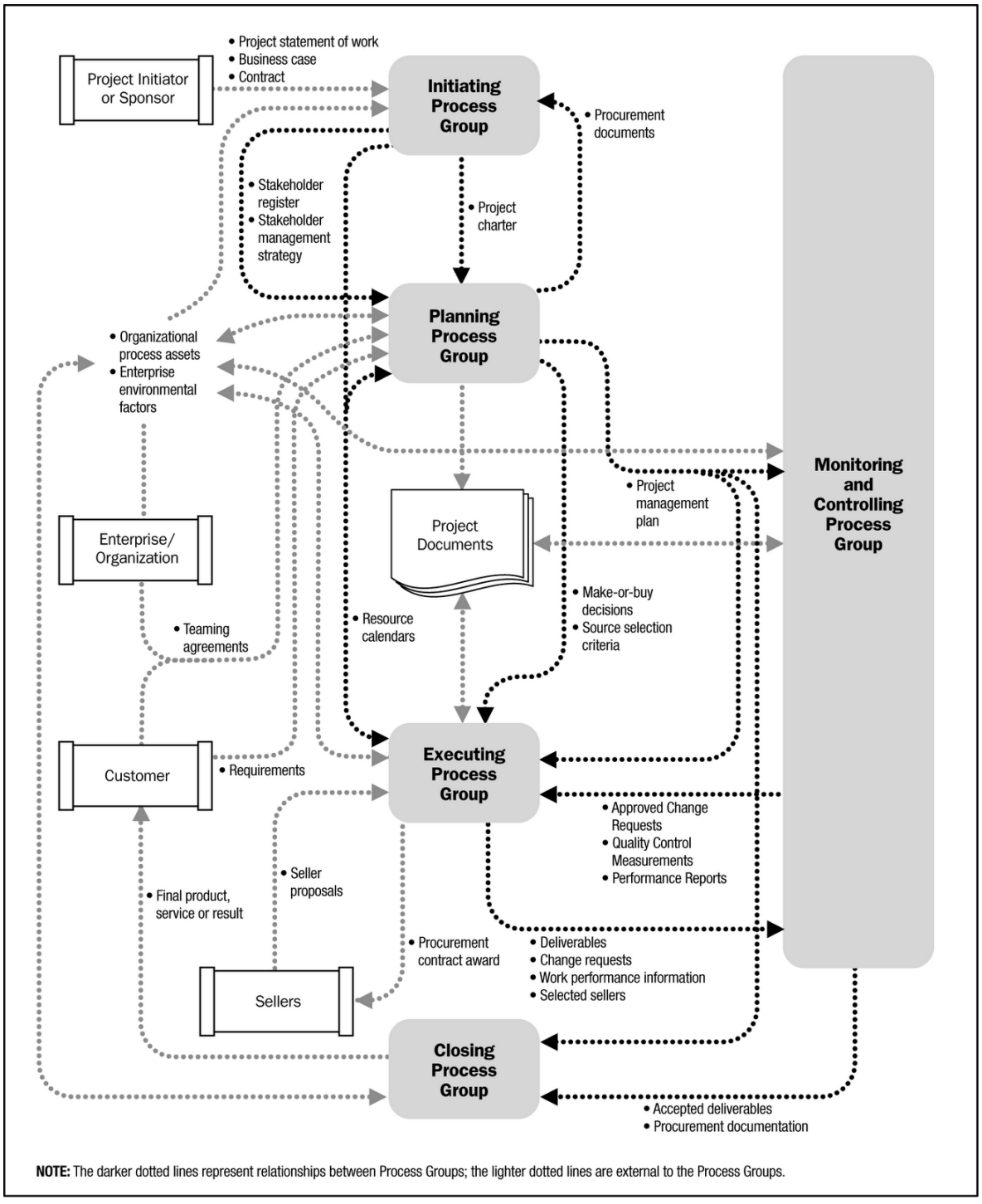


Figure 3. Project Management Process Interactions (Source: Project Management Institute, 2013, p.53)

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 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 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 Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 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 Perform Quality Assurance	8.3 Control Quality	
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control 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 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

Figure 4. Project Management Process Group and Knowledge Area Mapping (Source: Project Management Institute, 2013, p.423)

2.2.5 Project management knowledge areas

PMBOK Guide© sites that there are a total of 10 project management knowledge areas, each of which is mapped to the 5 project management process groups (shown in *figure 5*). They are termed as "an identified area of project management [that is] defined by its knowledge requirements and described in terms of its component processes, practices, tools and techniques" (Project management Institute, 2013, p.554). The knowledge areas are selected in accordance with its suitability for this specific project.

- Project integration management follows the development of the project charter and the project management plan. It essentially consolidates all the project management processes and activities, and looks at the project holistically.
- Project scope management will ensure "… that project work includes all the required and only the work [that is] required to complete the project successfully" (Project Management Institute, 2013, p.105) by collecting project requirements and the creation of the work breakdown structure (WBS).
- Project time management will help in the scheduling of project activities to ensure timely completion.
- Project cost management will assist in budgeting of project finances.
- Project quality management will identify quality standards and indicate how the project will demonstrate compliance.
- Project human resource management will help to manage the team and denote the necessary people, skills etc. required to perform the work.
- Project communications management in developing a communication management plan to manage communications with stakeholders.
- Project risk management will help to identify risks and how they will affect the project.

- Project procurement management, based on the project requirements will assist in the planning of purchasing activities (sourcing suppliers etc.) and help to determine whether the project materials can be manufactured in-house.
- Project stakeholder management will ensure that all relevant stakeholders are identified and a plan is created to manage these stakeholders effectively in accordance to their needs and potential impact to the project work and deliverables.

2.3 Housing Construction Concept

The housing construction industry as like many other industries key to St. Vincent and the Grenadines has experienced many calamitous events that have affected its development. St Vincent and the Grenadines industrial structure is controlled mainly by services such as real-estate, renting etc. With a recorded GDP of 48.1% in 2013, among the largest sectors as a percentage of gross value added is the construction sector at 8% and in 2012 construction appeared amongst the largest sectors for employment at 13.5% as per Caribbean Community data (CARICOM), employing approximately 5,000 Vincentians (Inter-American Development Bank, 2013).

The ministry of Housing, Informal Human settlements, Land and Surveys and Physical Planning is the governmental body whose mandate “is to assist the Government of St. Vincent and Grenadines in providing affordable housing opportunities for Vincentian nation-wide while simultaneously embarking on the development endeavours designed, strategically to ensure its sustainability and validity as a statutory corporation.” The services rendered by the department are the “processing of planning applications for physical development and construction, implement the Town and Country planning Act which regulates built development in St. Vincent and the Grenadines, educate, advise and provide

information to the general public on policies, plans, programmers and standards related sustainable physical development [and to] prevent unauthorized development including unauthorized construction and occupation of lands" (Government of St. Vincent and the Grenadines). All requests for domestic and industrial construction must go to the Planning Department as mentioned in the final group project. (Town and County Planning Act No. 45, pg. 168 & 171)

An extract from the SAINT VINCENT AND THE GRANDINES GOVERNMENT GAZETTE dated Tuesday 24th October, 2017 – (No.56) shows a regulatory framework by the Planning Department as a requirement which is mandatory in any construction whether it be a single home, commercial building and or sub-division of lands or public housing in the country. (**Appendix 4**)

Data received from the St. Vincent and the Grenadines Planning Department over a 10 year period is under review.

Planning Approvals (over 10 year period)	
Year	**No of Plans received**
2007	606
2008	606
2009	662
2010	586
2011	480
2012	490
2013	510
2014	416
2015	449
2016	568

(The number of plans submitted over the period was not available from the Planning Department).

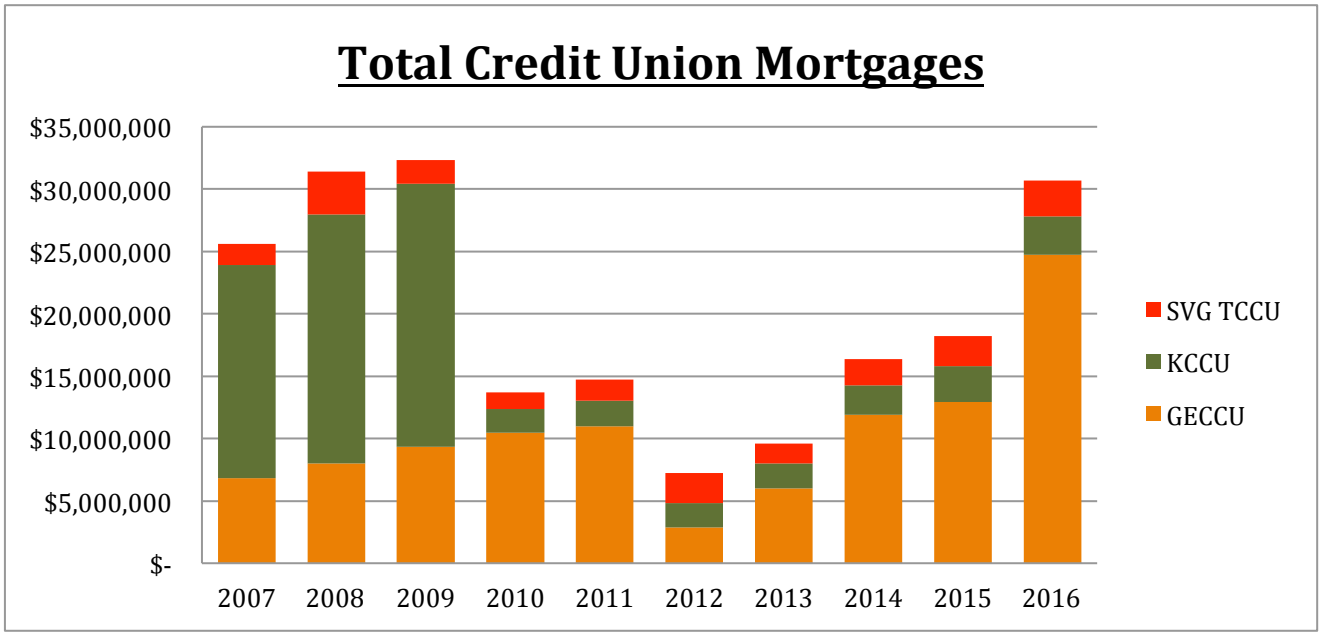
The presiding government since office has implemented the housing revolution which has presented notable improvements. Since then, the 2012 census showed that the number of households in had increased by 20% and a decline in the number of persons per households of 3 persons compared to 3.6 owing to new home construction, home expansions and ultimately better quality housing (The Vincentian, n.d.). Governmental policy regarding housing and construction in St. Vincent and the Grenadines featured the building of six hundred and seventy-seven low and middle income houses to date since 2001 when the ULP Government take office. These houses are 1 bedroom, 2 bedroom and three (3) bedroom family units. This further enhances the housing stock in the country and most perspective home owners obtain financing for purchasing of these houses. Historical point of note is that two (2) of the credit unions have entered the housing market and purchase lands to be sold to perspective home owner. The data is not available on how many home owners have constructed houses by this arrangement.

In the absence of loan disbursements relative to mortgage payments from leading banking institutions, relative information can be deduced from leading credit unions of which similar loans is granted for housing. The three credit unions in reference are the General Employees Cooperative Credit union (GECCU), The Kingstown Cooperative Credit Union (KCCU), and The St. Vincent Teacher Cooperative Credit Union (SVG TCCU).

The subsequent table illustrates loans dispersed by Three (3) Credit Unions over a ten (10) years period. Over this 10 year period the total value of loans distributed amounted to approximately XCD$200 million dollars and has shown improvements in the last three years following the economic downturn.

Credit Union Mortgages Year 2007 to 2016

		GECCU	KCCU	SVG TCCU	Total Mortgage per year
Category	**Year**	**$**	**$**	**$**	**$**
Mortgage	2007	$6,813,187	$17,115,916	$1,676,924	**$25,606,027**
	2008	$8,016,980	$19,944,356	$3,427,000	**$31,388,336**
	2009	$9,338,195	$21,072,897	$1,935,909	**$32,347,001**
	2010	$10,482,575	$1,901,927	$1,333,315	**$13,717,817**
	2011	$10,972,917	$2,042,991	$1,710,028	**$14,725,936**
	2012	$2,846,558	$1,981,107	$2,408,526	**$7,236,191**
	2013	$5,997,471	$2,026,655	$1,543,967	**$9,568,093**
	2014	$11,896,413	$2,355,365	$2,091,138	**$16,342,916**
	2015	$12,950,354	$2,833,732	$2,453,797	**$18,237,883**
	2016	$24,711,784	$3,080,378	$2,875,784	**$30,667,946**
Total		**$104,026,434**	**$74,355,324**	**$21,456,388**	**$199,838,146**



3 METHODOLOGICAL FRAMEWORK

3.1 Information sources

The free dictionary (as cited in The Great Soviet Encyclopedia, 3E. 2010) defines an information source as “any system producing information or containing information intended for transmission…” (“Information Source”, n.d.). Wikipedia describes an information source (as cited in Dictionary.com. 2017), “is a person, thing or place from which information comes, arises or is obtained. Information sources are divided into separate distinct categories, primary, secondary and territory and so on.” (“Information Source”, n.d.).

3.1.1 Primary sources

“A primary source is a document, speech or other sort of evidence written, created or otherwise produced during the time under study” (MacDonald & Headlam, n.d.). “Primary sources of information are those that provide first-hand accounts of the events, practices, or conditions you are researching. In general, these are documents that were created by the witnesses or first recorders of these events at about the time they occurred, and include diaries, letters, reports, photographs, creative works, financial records, memos, and newspaper articles… [They] also include first-hand accounts that were documented later, such as autobiographies, memoirs, and oral histories…” (Primary Source Village, n.d.).

For the final graduation project, the primary sources that will be used are from personal communication or interviews with the owner of Hopey Construction, and other stakeholders, in addition to observations.

3.1.2 Secondary sources

MacDonald and Headlam define a secondary source as cited in CLES: Research Methods Handbook, as "that collected by other people…" ("Secondary Source", p.17). "A secondary source of information is one that was created later by someone who did not experience first-hand or participate in the events or conditions you're researching. For the purposes of a historical research project, secondary sources are generally scholarly books and articles…" (Primary Source Village, n.d.).

For this final graduation project all secondary sources such as the PMBOK Guide©, PMI databases, Saint Vincent and the Grenadines Building Regulations and Guidelines etc. will be used for the development of the project.

Table 3-1. Information Sources (Source: The Author, 2017)

Objectives	Information sources	
	Primary	**Secondary**
To create a project charter to formally authorize the project and to give the project manager the authority to apply organizational resources to the project resources.	Interviews, email correspondence	PMBOK Guide©
To create a scope management plan to ensure that all required project work is	Interviews, email correspondence	PMBOK Guide©, Government Regulations and Guidelines, Architectural drawings, Historical data, textbooks, media information

incorporated in order to successfully complete the project.		(Internet), other related literature pertaining to project management plans.
To create a schedule management plan to guide the project schedule to ensure a timely delivery of the project deliverables.	Interviews, email correspondence	PMBOK Guide©, Architectural drawings, Historical data, textbooks, media information (Internet), and other related literature pertaining to project management plans.
To create a cost management plan to plan how cost relating to the project will be managed in order to avoid budget overrun.	Interviews, email correspondence	PMBOK Guide©, Architectural drawings, Historical data, textbooks, media information (Internet), and other related literature pertaining to project management plans.
To create a quality management plan to achieve the acquired standard necessary for a successful project delivery.	Interviews, email correspondence	PMBOK Guide©, Architectural drawings, Historical data, textbooks, media information (Internet), and other related literature pertaining to project management plans.
To create a human resource management plan to determine the staffing requirements during the life of the project.	Interviews, email correspondence	PMBOK Guide©, Architectural drawings, Historical data, textbooks, media information (Internet), and other related literature pertaining to project management plans.

To create a communications management plan to foster inefficient and effective communication between the client and the company.	Interviews, email correspondence	PMBOK Guide©, Architectural drawings, Historical data, textbooks, media information (Internet), and other related literature pertaining to project management plans.
To create a risk management plan that will describe how project risks will be managed and controlled in order to avoid project schedule delays and costs overrun.	Interviews, email correspondence	PMBOK Guide©, Architectural drawings, Historical data, textbooks, media information (Internet), and other related literature pertaining to project management plans.
To create a procurement management plan that will act as a guideline to manage procurements throughout the life of the project.	Interviews, email correspondence	PMBOK Guide©, Architectural drawings, Historical data, textbooks, media information (Internet), and other related literature pertaining to project management plans.
To create a stakeholder management plan to develop the stakeholder register in order to identify and help to engage the key stakeholders.	Interviews, email correspondence	PMBOK Guide©, Architectural drawings, Historical data, textbooks, media information (Internet), and other related literature pertaining to project management plans.

3.2 Research methods

Kothari in Research Methodology Methods and Techniques second edition describes research methods as “all those methods or techniques that are used for conduction of research… [they] refer to the methods the researchers use in performing research operations” (Kothari, 2004).
The final graduation project is being developed to explore a formal approach to planning construction projects using PMI best practices and standards for the company as opposed to the traditional planning method used.

3.2.1 Qualitative Research Method

“Qualitative research, … is concerned with qualitative phenomenon, i.e., phenomena relating to or involving quality or kind… This type of research aims at discovering the underlying motives and desires, using in depth interviews for the purpose” (Kothari, 2004, p. 3). Research Methodology: Methods and Techniques second edition describes qualitative research as “concerned with a quality of information, qualitative methods attempt to gain an understanding of the underlying reasons and motivations for actions and establish how people interpret their experiences and the world around them. Qualitative methods provide insights into the setting of a problem, generating ideas and/or hypotheses” (MacDonald & Headlam, n.d., p.68)

3.2.2 Analytical Method

According to Research Methodology: Methods and Techniques second edition “in analytical research, … the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.” (Kothari, 2004, p.3). In Analytical Research (as cited in Scribd.com), “the researcher has to use facts or information already available, and analyze them to

make a critical evaluation of the material" ("Research Methodology: Analytical Research", Slide. 5).

Table 3-2. Research Methods (Source: The Author, 2017)

Objectives	Research methods	
	Qualitative Research Method	**Analytical Method**
To create a project charter to formally authorize the project and to give the project manager the authority to apply organizational resources to the project resources.	Method applied through the use of interviews to gain expert judgment or knowledge and the required information from other key stakeholders.	Method applied through the use of Architectural drawings and other sources.
To create a scope management plan to ensure that all required project work is incorporated in order to successfully complete the project.	Method applied through the use of interviews to gain expert judgment or knowledge and the required information from other key stakeholders.	Method applied through the use of Architectural drawings, country building codes and guidelines.
To create a schedule management plan to guide the project schedule to ensure a timely delivery of the project deliverables.	Method applied through the use of interviews to gain expert judgment or knowledge and the required information	Method applied through the use of Architectural drawings and other sources.

	from other key stakeholders.	
To create a cost management plan to plan how cost relating to the project will be managed in order to avoid budget overrun.	Method applied through the use of interviews to gain expert judgment or knowledge and the required information from other key stakeholders.	Method applied through the use of Architectural drawings and other sources.
To create a quality management plan to achieve the acquired standard necessary for a successful project delivery.	Developed based on interviews to determine the quality required from stakeholders and experts in the field.	Method applied through the use of Architectural drawings and other sources.
To create a human resource management plan to determine the staffing requirements during the life of the project.	Developed based on interviews with the company to determine human resource requirements.	Method applied through the use of Architectural drawings, organization documents and other sources.
To create a communications management plan to foster inefficient and effective communication between the client and the company.	Developed based on interviews stakeholders to determine their communication requirements.	Method applied through the use of Architectural drawings, organization documents and other sources.
To create a risk management plan that will describe how	Method applied through the use of	Method applied through the use of

project risks will be managed and controlled in order to avoid project schedule delays and costs overrun.	interviews to gain expert judgment.	Architectural drawings and other sources.
To create a procurement management plan that will act as a guideline to manage procurements throughout the life of the project.	Method applied through the use of interviews to gain expert judgment.	Method applied through the use of Architectural drawings, organization documents and other sources.
To create a stakeholder management plan to develop the stakeholder register in order to identify and help to engage the key stakeholders.	Developed based on interviews and observations to identify stakeholders and their interest in the project.	Method applied through the use of project management literature and other source documents.

3.3 Tools

According to PMBOK Guide©, a tool is defined simply as “something tangible, such as a template or software program, used in performing, used in performing an activity to produce a product or result” (Project Management Institute, 2013). The tools relevant to this project are described in *Table 3*, as per tools listed in the A Guide to the Project Management Body of Knowledge (PMBOK Guide©) fifth edition.

Table 3-3. Tools (Source: The Author, 2017 & PMBOK Guide© ,2013)

Objectives	Tools
To create a project charter to formally authorize the project and to give the project manager the authority to apply organizational resources to the project resources.	Expert Judgment Facilitation Techniques
To create a scope management plan to ensure that all required project work is incorporated in order to successfully complete the project.	Expert Judgment, Meetings, Interviews, Observations, Prototypes, Benchmarking, Document analysis, Product analysis, Alternatives generation
To create a schedule management plan to guide the project schedule to ensure a timely delivery of the project deliverables.	Expert judgment, Analytical techniques, meetings, Decomposition, Rolling wave planning, Precedence diagramming method (PDM), Bottom-up estimating, Analogous estimating, Critical Path method, Reserve analysis
To create a cost management plan to plan how cost relating to the project will be managed in order to avoid budget overrun.	Expert judgment, Meetings, Analytical techniques, Analogous estimating, Reserve analysis, Project management software, Cost aggregation, Reserve analysis, Funding limit reconciliation
To create a quality management plan to achieve the acquired standard necessary for a successful project delivery.	Cost of quality, Benchmarking, Meetings

To create a human resource management plan to determine the staffing requirements during the life of the project.	Organizational charts and position descriptions, Expert judgment, Meetings
To create a communications management plan to foster inefficient and effective communication between the client and the company.	Communication requirements analysis, Communication technology, Meetings
To create a risk management plan that will describe how project risks will be managed and controlled in order to avoid project schedule delays and costs overrun.	Expert judgment, meetings, SWOT analysis, Checklist, Probability and impact analysis, Strategies for negative risks or threats, Strategies for positive risks or opportunities, Contingent response strategies
To create a procurement management plan that will act as a guideline to manage procurements throughout the life of the project.	Make or buy analysis, Expert Judgment, Market research, Meetings
To create a stakeholder management plan to develop the stakeholder register in order to identify and help to engage the key stakeholders.	Expert Judgment, Stakeholder analysis, Meetings

3.4 Assumptions and constraints

According to the PMBOK Guide©, assumptions are defined as “a factor in the planning process that is considered to be true, real, or certain, without proof or demonstration (Project Management Institute, 2013). Assumptions are based on knowledge, experience or the information available on hand. They are

anticipated events that are expected to take place during the project life cycle (Usmani, n.d.).

A constraint is defined as an “element, factor, or subsystem that works as a bottleneck. It restricts an entity, project or system… from achieving its potential… with reference to its goal” (Dictionary.com, n.d.). In project management (as cited in whatIs.com) it is described as “any restriction that define a project’s limitations; the scope” (“Constraints (Project Constraint)”, n.d.). The PMBOK Guide© lists constraints such as scope, quality, schedule, budget, resources and risks, most importantly the triple constraint of the three elements; time, cost and scope that can influence a project of which this final graduation project is not immune to. The assumptions and constraints of the project are explained in the below mentioned *Table 4*.

Table 3-4. Assumptions and Constraints (Source: The Author, 2017)

Objectives	**Assumptions**	**Constraints**
To create a project charter to formally authorize the project and to give the project manager the authority to apply organizational resources to the project resources.	Permission to conduct the project will be approved. The project charter will be created before the other auxiliary plans.	Shortened time frame to collect the necessary information.
To create a scope management plan to ensure that all required project work is incorporated in order to successfully complete the project.	The scope of the project will remain unchanged. In the event of a change, it will go through the proper change control channel.	Shortened time frame for the information. Competing schedules and/ ongoing projects may affect scheduling meetings with the company/ owner.

Objectives	Assumptions	Constraints
To create a schedule management plan to guide the project schedule to ensure a timely delivery of the project deliverables.	The schedule for the completion of the project is adequate.	Shortened time frame for the information.
To create a cost management plan to plan how cost relating to the project will be managed in order to avoid budget overrun.	Budget is adequate and will not be exceeded.	Change in scope could threaten an extension in project budget.
To create a quality management plan to achieve the acquired standard necessary for a successful project delivery.	Project requirements will be collect and documented.	Lessons learnt from previous projects were never formally documented.
To create a human resource management plan to determine the staffing requirements during the life of the project.	The organization has adequate human resources necessary to complete the project.	The plan will not account for additional labour required.
To create a communications management plan to foster inefficient and effective communication between the client and the company.	There is the necessary or required technology available to facilitate communication.	Competing schedules may interfere with communication attempts.
To create a risk management plan that will describe how project risks will be managed and controlled in order to avoid project schedule delays and costs overrun.	All major risks will be accounted for and the necessary actions and budget allocations made.	Lessons learnt from previous projects were never formally documented. Late scope changes may bring about risks not included during planning.
To create a procurement management	The company will be able	Shortage of raw

Objectives	Assumptions	Constraints
plan that will act as a guideline to manage procurements throughout the life of the project.	to manufacture and provide most building materials internally. The balance of materials will be sourced locally.	materials to manufacture building products could threaten production and project schedule.
To create a stakeholder management plan to develop the stakeholder register in order to identify and help to engage the key stakeholders.	All the necessary stakeholders will be identified. The plan will effectively show how stakeholders will be managed. Stakeholders level of interest will not experience significant variation that will affect the plan.	The time frame may threaten he proper identification of all stakeholders.

3.5 Deliverables

According to the PMBOK Guide©, a deliverable is “ay unique and verifiable product, result or capability to perform a service that is required to be produced to compete a process, phase, or project. [They] are typically tangible components completed to meet project objectives and can include elements of the project management plan (Project Management Institute, 2013). The deliverables that will be developed in the final graduation project are listed below in *Table 5*.

Table 3-5. Deliverables (Source: The Author, 2017)

Objectives	Deliverables
To create a project charter to formally authorize the project and to give the project manager the authority to apply organizational resources to the project resources.	Project Charter
To create a scope management plan to ensure that all required project work is incorporated in order to successfully complete the project.	Scope Management Plan
To create a schedule management plan to guide the project schedule to ensure a timely delivery of the project deliverables.	Schedule Management Plan
To create a cost management plan to plan how cost relating to the project will be managed in order to avoid budget overrun.	Cost Management Plan
To create a quality management plan to achieve the acquired standard necessary for a successful project delivery.	Quality Management Plan
To create a human resource management plan to determine the staffing requirements during the life of the project.	Human Resource Management Plan
To create a communications management plan to foster inefficient and effective communication between the client and the company.	Communications Management Plan

To create a risk management plan that will describe how project risks will be managed and controlled in order to avoid project schedule delays and costs overrun.	Risk Management Plan
To create a procurement management plan that will act as a guideline to manage procurements throughout the life of the project.	Procurement Management Plan
To create a stakeholder management plan to develop the stakeholder register in order to identify and help to engage the key stakeholders.	Stakeholder Management Plan

4 RESULTS

The project management plans will highlight the necessity of planning in preparation fro projects as a good management practice. With proper documentation in place there is the ability to reference planned information against actual to check for variations and enable accountability on all aspects of the project. The accompanying documents will provide guidance for the project to guarantee that all work necessary for the successful completion of the project will be performed and exclude all other options outside the scope unless otherwise approved through the approved change control process. These project management plans will utilize selected available templates from Project Management Docs to best illustrate and compile project documents and project management software.

4.1 Project Charter

The subsequent project charter formally authorizes the project. It gives the details pertaining to the project background, project scope, the owner and sponsor of the project, the area of focus for the project, its purpose, project objectives, business objectives, project budget, assumptions, constraints, risks and organization. The project charter is an output of the develop project charter process for project integration management.

Project Background

This project is being undertaken to act as a rented accommodation for the Mandeville's family. The project site is located in Richmond Hill, Kingstown St. Vincent and the Grenadines and is scheduled to commence on the Wednesday 2nd May 2018. The construction project will be undertaken by Hopey

Construction, spearheaded by Mr. Reynold Hope a reputable construction company known for its quality construction, dedication towards customer satisfaction and contributing to better living standards of the population.

Project Scope

- To construct a single-family dwelling apartment
- Construction of retaining wall
- Grading/ leveling off the land (landscaping)

Sponsorship and Ownership

The project is sponsored by the Mandeville family and the final deliverable will be owned by the same.

Area of Focus/ Application Area

Construction

Purpose

- Provide a new revenue stream fro the client
- Increase rented accommodation for the area

Project Objectives

The objectives of this project are as follows:

- Building permit approved
- Management plans complete
- Excavation complete
- Termite treatment complete
- Foundation complete
- Prepared reinforce floor slab complete

- Flooring cast
- Partition blocks installed
- Second phase plumbing installed
- Ring beam cast
- Roof complete
- Windows installation complete
- Doors installation complete
- Vents installation complete
- Plastering complete
- Third phase plumbing complete
- Third phase electrical complete
- Kitchen counter complete
- Kitchen cupboards complete
- Bedroom closet complete
- Tiling complete
- Painting complete
- Retaining wall complete
- Landscaping complete
- Site clean up complete
- Final building inspection complete
- Handover complete
- Project review and documentation complete

Business Objectives

- To create a documented strategic plan to managing projects using the current project as a case study for future projects
- Improve the current quality of construction projects
- To foster better record keeping and to establish lessons learnt for future projects.

Budget

A budget of XCD$55,000.00 has been allocated to complete the construction project. Inclusive of the budget is XCD$5,000.00 used as a contingency reserve under the approval of the client.

Assumptions

- The resources required will be readily available
- The total cost of the project will not increase
- The project scope will remain unchanged

Constraints

- Short time frame to construct the project
- Project budget must be respected

Risks

- Shortened schedule
- Shortage of materials or resources can create a void in contributions to project knowledge and impact the quality of the project.

Organization

- Project manager
- Contractor
- Architect
- Labourers
- Suppliers
- Sub-contractor
- Government Agencies
- External Companies (utilities)

4.2 Project Scope Management Plan

The subsequent project scope management plan details the scope of the project and helps to ensure that only the work described is planned for and carried out. The processes to create the project scope management plan relative to this project are to first plan scope management, collect requirements, define scope, and create WBS. The project charter is used to create the project scope management plan alongside the expert judgment of the contractor, architect etc. and meetings with the client. Upon collection of he requirements the Work Breakdown Structure (WBS) ***Figure 11*** and WBS dictionary ***Table 4-1*** is created. The scope management plan gives details pertaining to the purpose and justification of the project, scope description, scope baseline, the approved architectural drawings ***Figure 5-10*** and the WBS and WBS dictionary.

PROJECT SCOPE MANAGEMENT PLAN

Introduction

This scope management plan will be used to ensure that only the work that is approved is to be conducted will be undertaken for the construction of the single family dwelling apartment. All work not included with the scope of the plan is not sanctioned except through the prescribed change control process. The plan will describe who will manage the project through pre-established roles and responsibilities and how the project in itself will be guided. The scope management plan is developed first upon analysis of the project charter and subsidiary plans namely the stakeholder management plan. The project manager is responsible and authorized to manage the project, in addition to its execution. The project manager is expected to utilize all available resources towards the planning of the project. The project sponsor is also expected to review and sign off on all the subsidiary plans of the project in agreement to impending work.

Purpose And Justification Of The Project

Project Description: “Construction of a Single Family Dwelling Apartment“

The project for the construction of a single-family dwelling has been approved and will be used to assist in managing future project portfolios for Hopey Construction. The apartment is being constructed to facilitate a new revenue stream for Mr. Mandeville and family. The apartment will be used as a rented out accommodation catering specifically to foreign students, providing safe and affordable housing.

Scope Description

The scope of the project comprises of all work relevant to the planning and execution that will entail the construction of a single-family dwelling apartment that will feature a freestanding or detached home of 1-½ stories.

As per Saint Vincent and the Grenadines Building Regulations 2008, we pay attention to the following definitions;

“Construction means unit building or comment assembly adaptive process and includes reconstruction, alteration or addition to a building or structure.”

“Apartment means one or more rooms occupied as a home or residence for an individual or family or a household. The existence of, or the installation of sink accommodations or cooking facilities within a room or suite of rooms shall be deemed sufficient to classify such room or suite as an apartment.”

“Dwelling means a building occupied exclusively for residential purposes; … dwelling also includes an verandah or porch attached permanently to the building.”

“Ground floor means the lowest storey or part of a storey of building of which more than 50% of the floor area is above the average of associated finished ground levels at external walls and no part of the floor area more than 2 feet below such associate ground levels.”

“Storey means that portion of a building between the upper surface of a floor and the upper surface of the floor next above it, and if there is no floor above it, that portion between the top of that floor and the ceiling above it.”

Scope Baseline

The scheduled duration of the project is eight months for the construction of the single family dwelling available resources. The project has a budgeted cost of XCD$55,000.00.

Approved Single Family Dwelling Architectural Drawings

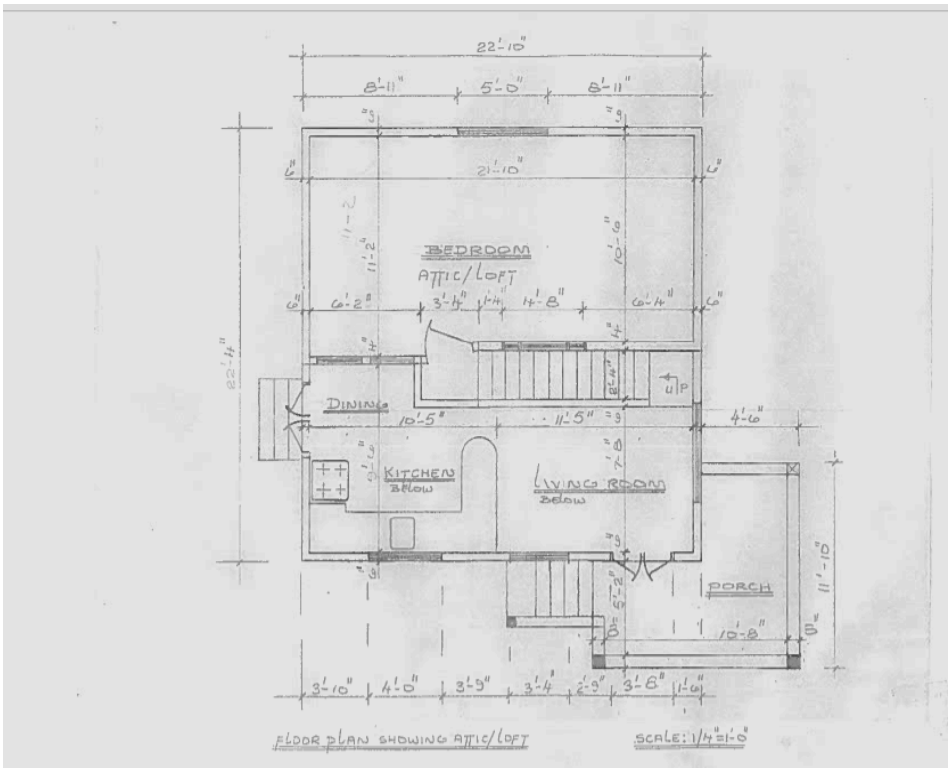


Figure 5. Floor Plan Showing Attic/ Loft

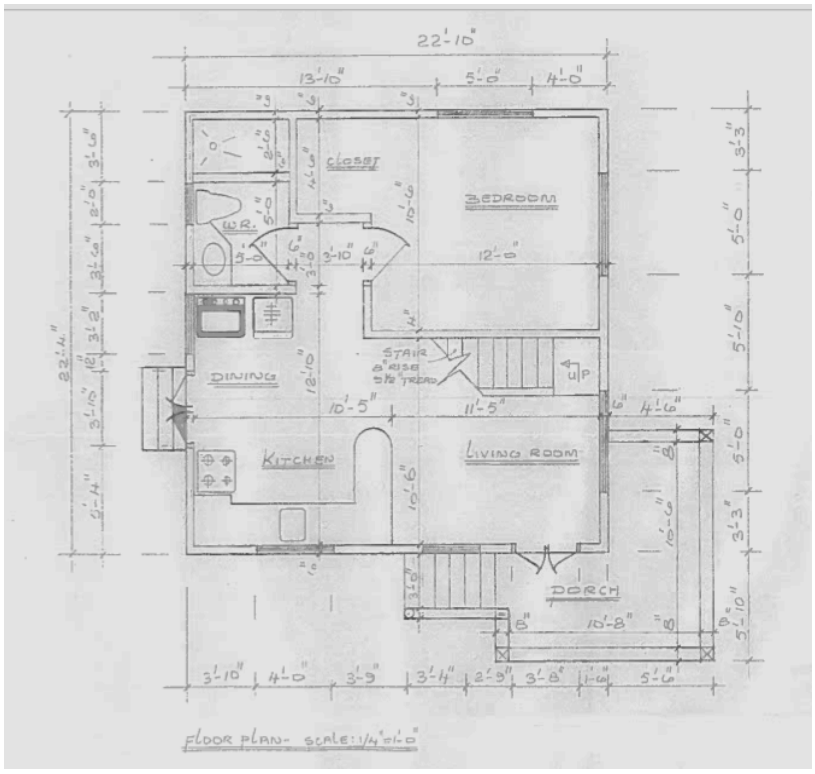


Figure 6. Ground Floor Plan

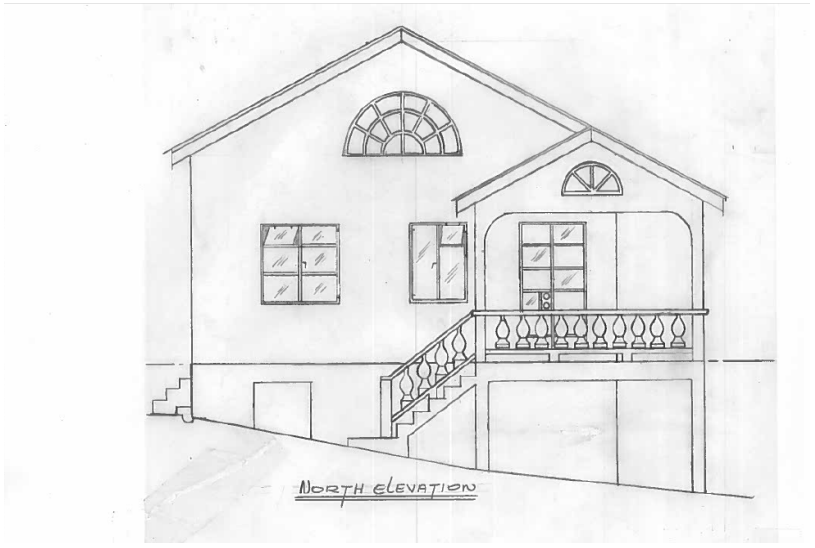


Figure 7. North Elevation

Figure 8. East Elevation

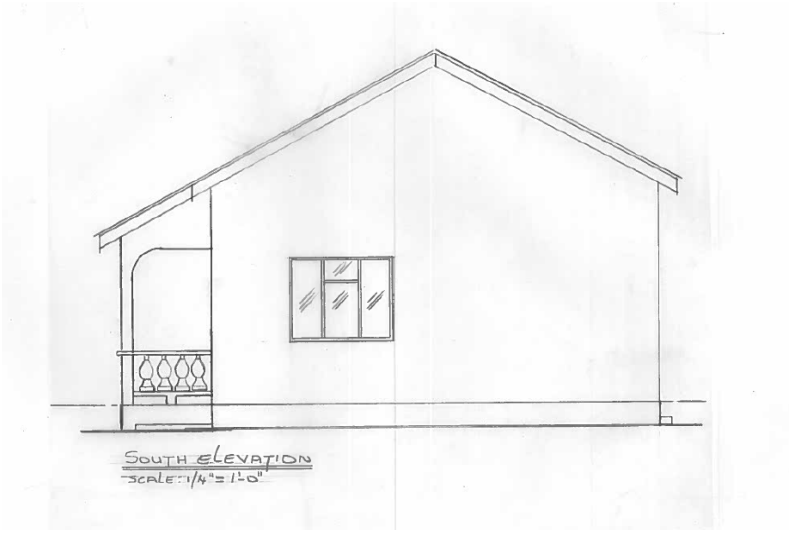


Figure 9. South Elevation

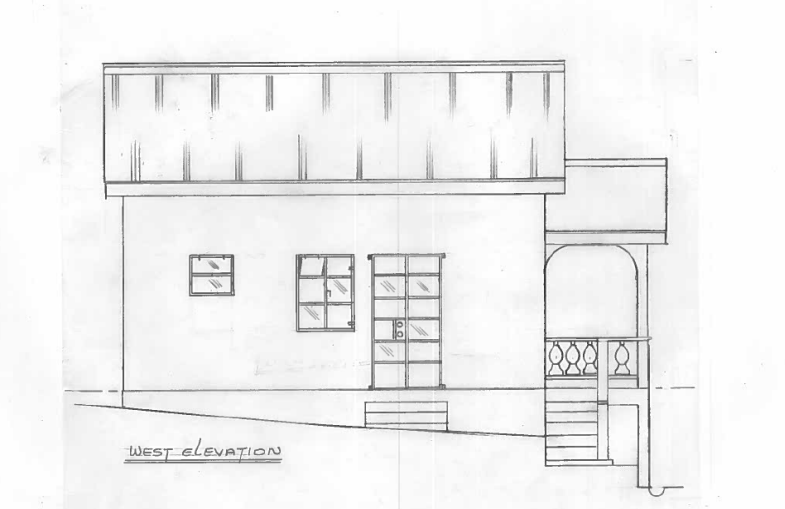


Figure 10. West Elevation

Project Location

The project site is located on mainland St. Vincent in Richmond Hill, on the lower section of a 10,000 sq. ft. plot of land consisting of a preexisting multi-family dwelling occupying 2,500 sq. ft. of land and located on the upper half of the property.

Apartment Details

- Ground floor
  - Three- Quarter Bathroom
  - Master Bedroom
  - Built-in Reach-in Closet
  - Kitchen, Dining, Laundry Combo
  - Living Room
  - Loft Access Staircase
  - L-Shape Porch
- ½ Storey/ Loft/ Attic
  - Bedroom
  - Built-in Reach-in Closet

Budget

The estimated budget required for this project is XCD$55,000 with a contingency of XCD$5,000.

Project Boundaries

The construction of a single-family dwelling will include all work that will be associated with the planning, executing, monitoring and controlling and closing of the project.

Activities Within The Scope Of The Project

a) Construction of a single-family dwelling 1 ½ storey apartment
b) Building/ construction of all cabinetry, balusters, stairs
c) Construction of a back/ retaining wall

Activities Outside Of The Scope

a) The furnishing and maintenance upon its completion
b) The creation of architectural drawings/ design

Project Constraints

a) The budget must be respected to avoid overrun of cost.
b) The project must be completed within the schedule of six months.
c) The contingency available in the project budget is 25%
d) Work must be done using the available resources
e) The project will be conducted during the rainy season, which may cause disruptions to the project schedule.

Project Assumptions

a) The construction crew and other specialist will be able to deliver to project specifications
b) The project dates are accurate and true.
c) The construction workers will work a 45 hours per week on the day shift.
d) The original budget will remain unchanged.
e) The resources required will be readily available.
f) Material will not increase beyond 5% during the course of the project

Work Breakdown Structure

The work breakdown structure illustrated is used to subdivide the work into various work packages to efficiently manage the project and ensure that all work required is scheduled for and completed. The method used to organize the WBS is by way of project phases, of which there are five. They are the initiation phase, the pre-construction phase, the construction phase, the post construction phase and the close out phase. Work packages that cover more than 40 hours (5 days) are further decomposed into a fourth level, the minimum number of hours being 8 hours.

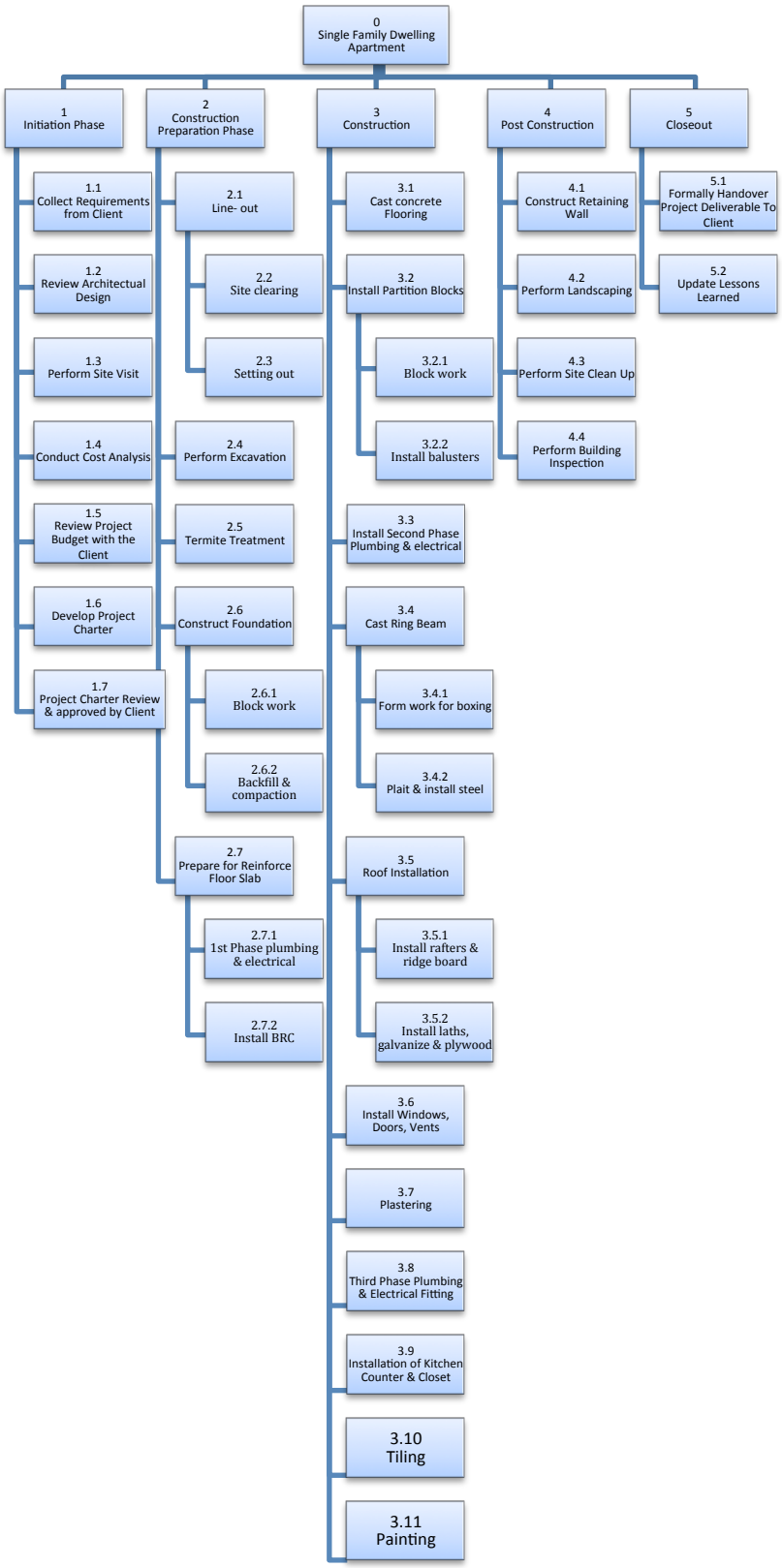


Figure 11. Work Breakdown Structure (WBS) (Source: Compiled by the author)

Table 4-1: WBS Dictionary (Source: Complied by the author)

LEVEL	WBS CODE	ELEMENT NAME	DEFINITION
1	0	Single Family Dwelling Apartment	All work necessary to execute the construction of the single family dwelling.
2	1	Initiation Phase	All work necessary to initiate the project.
2	1.1	Collect Requirements from Client	Collect all requirements and derive a clear understanding of what is required and the scope of work to be carried out.
2	1.2	Review Architectural Design	Examine architectural drawings to gain better understanding of the scope of work to be executed and to assist in subsequent cost analysis.
2	1.3	Perform Site Visit	Work site is examined to assist in familiarization and further assessment of architectural plans.
2	1.4	Conduct Cost Analysis	All works required is assessed, expert judgment is applied to evaluate budget soundness.
2	1.5	Review Project Budget with the Client	The Project Sponsor reviews the project budget with the project manager based on preceding cost analysis.

2	1.6	Develop Project Charter	Project Manager develops Project Charter.
2	1.7	Project Charter Review & Approved by Client	Project sponsor reviews the Project Charter and approves it through signing.
3	2	Construction Preparation Phase	Construction site is prepared to commence work.
3	2.1	Line-out	Setting out of construction area.
3	2.2	Perform Excavation	Digging of foundation.
3	2.3	Treat for Pests	Treating the foundation for termites and other pests.
3	2.4	Prepare Foundation	Construction foundation by means of block work, backfill and compaction.
3	2.5	Prepare for Reinforce Floor Slab	First phase plumbing, conduit electrical and installation of BRC wire.
4	3	Construction	Commencement of construction work.
4	3.1	Cast Flooring	Installation of concrete flooring.
4	3.2	Install Partition Blocks	All block work is carried out including parameter and internal block work.
4	3.3	Install Second Phase Plumbing & Electrical	All plumbing and electrical that run through the block work is installed.
4	3.4	Cast Ring Beam	Form work for boxing, plait and install steel and casting work.

4	3.5	Roof Installation	All works for the erection of the roof including installation of rafters, ridge board, galvanize plywood, laths and guttering.
4	3.6	Install Windows, Doors, vents	Installation of all windows, doors and vents for the apartment.
4	3.7	Plastering	Plastering of all walls, outdoor drain, and staircase to loft, porch and the installation of balusters.
4	3.8	Third Phase Plumbing & Electrical Fitting	Installation of final plumbing and electrical fittings.
4	3.9	Installation of Kitchen Counter & Closet	Construction and installation of kitchen counter and main bedroom closet.
4	3.10	Tiling	Tiling of all ground level floors.
4	3.11	Painting	Painting of interior and exterior walls and porch.
5	4	Post Construction	After the construction of the main building is complete.
5	4.1	Construct Retaining Wall	Construction of retaining wall behind the apartment to prevent landslide.
5	4.2	Perform Landscaping	Grade the land where necessary.
5	4.3	Perform Site Clean Up	Remove all rubbish accumulated during construction.

5	4.4	Perform Building Inspection	Perform final inspection on the building to ensure all work required has been completed.
6	5	Closeout	Final stage of the project.
6	5.1	Formally Handover Project Deliverable to Client	The Project Sponsor formally accepts the project through signature.
6	5.2	Update Lessons Learned	Update documents to record lessons learned for future projects.

4.3 Project Schedule Management Plan

The subsequent project schedule management plan details the project schedule in order to ensure the timely completion of the project. The processes to create the project schedule management plan relative to this project are to plan schedule management, define activities, sequence activities, estimate activity resources and durations, and develop the schedule. Here, expert judgment, information from subsidiary plans in addition to meetings with the client and other tools and techniques are used to develop the schedule management plan. The schedule management plan gives details pertaining to the milestone list ***Table 4-2***, activity list, duration and resources ***Figure 12***, network diagram ***Figure 13*** and Gaatt chart ***Figure 14***. The MS Projects 2016 software was used to develop the diagrams presented in this section.

PROJECT SCHEDULE MANAGEMENT PLAN

Introduction

The project schedule management plan will guide the timely completion of the project. It will show how the project activities will be managed, and their duration. The tools used to plan schedule management are meetings and expert judgment of projects similar in nature, activities are defined through decomposition into smaller deliverables. Activities will be sequenced through the precedence diagramming method and finally the estimation of activity resources and time will be performed by way of project management software and expert judgment.

Table 4-2. Milestone List & Dates (Source: compiled by the author)

MILESTONES	DATE	DESCRIPTION
Develop project charter	Monday 30th April, 2018	Developed project charter approved by client.
Site Clearing and setting out	Wednesday 2nd May, 2018	Clearing the property and preparations to commence construction.
Foundation completion	Monday 28th May, 2018	Excavation work is complete. Reinforcement floor slab installed (including conduit and plumbing) and casting work complete.
Parameter and internal walls installed	Monday 30th July, 2018	Block work and the installation of reinforcement steel
Installation of balusters	Thursday 9th August, 2018	Assembly and installation of balusters for the porch and exterior staircase.
Roof Installation	Tuesday 8th September, 2018	Cast ring beams, installation of roofing materials complete
Installation of windows, doors and vents	Friday 28th September, 2018	Installation of iron windows and doors, and vent near peak.
Plastering complete	Monday 22nd October, 2018	Rendering of all walls, flooring, staircase leading to loft and drains.
Installation of plumbing and	Thursday 1st November,	Installation of second phase plumbing and electrical.

electrical fixtures	2018	
Installation of kitchen counters and closet	Friday 23rd November, 2018	Items preselected by the client as per materials previously acquired.
Completion of Tiling	Monday 14th January, 2019	All tiles required for both indoors and outdoors are approved by the Sponsor, in addition to tiles pre-purchased by client.
Completion of painting	Tuesday 5th February, 2019	Priming of walls and balusters and final coat of paint applied. Colour preselected by client.
Retaining wall & Landscaping complete	Tuesday 19th February, 2019	Back wall installed and site clean up performed.
Project Complete	Monday 25th February, 2019	The deliverable undergoes final inspection, the project sponsor has accepted and signed off on all deliverables.

Estimate Activity Duration

Activity resources are estimated using expert judgment, Project Management Software and bottom-up estimating (PERT) a technique that uses a three-point estimation technique to define activity duration as shown in the table.

(tM) Most Likely
(tO) Optimistic
(tP) Pessimistic
PERT (tE) = (tO + 4 tM + tP) /6

According to the PERT estimate, the project activities will be completed in 237 days, the optimistic duration or best-case duration estimate for project completion is 159 days and the pessimistic or worst case duration estimate is 318 days towards project completion.

Table 4-3. PERT Estimate

Activity ID	Description	Predecessor	Optimistic Duration	Most Likely Duration	Pessimistic Duration	PERT Estimate
1	Collect Requirements	NA	1	1	2	1
2	Review architectural design	1	1	1	2	1
3	Perform site visit	2	0.5	1	1	1
4	Conduct cost analysis	3	1	2	3	2
5	Review project budget with client	4	1	1	2	1
6	Develop project charter	5	1	2	3	2
7	Project charter review & approved by client	6	1	1	2	1
8	Site clearing	7	1	1	2	1
9	Setting out	8	0.5	1	2	1
10	Perform excavation	9	4	5	7	5
11	Termite Treatment	10	0.5	1	2	1
12	Block work	11	5	7	10	7
13	Backfill and compaction	12	2	3	5	3
14	1st Phase plumbing & electrical	13	3	6	10	6
15	Install BRC	14	0.5	1	2	1

16	Cast concrete flooring	15	1	2	3	2
17	Block work	16	20	30	35	29
18	Install balusters	17	4	7	10	7
19	Install second Phase plumbing & electrical	16	20	30	32	29
20	Form work for boxing	17, 19	5	7	10	7
21	Plait & install steel	20	5	7	10	7
22	Casting	21	1	1	2	1
23	Install rafters & ridge board	22	5	7	10	7
24	Install laths, galvanize & plywood	23	5	7	10	7
25	Guttering	24	2	3	5	3
26	Install windows, doors & vents	25	4	7	10	7
27	Plastering	26	10	14	20	14
28	Third phase plumbing and electrical fitting	27	5	7	10	7
29	Installation of kitchen counter & closet	28	10	14	20	14
30	Tiling	29	20	31	35	30
31	Painting	30	10	14	20	14
32	Construct retaining wall	31	5	7	10	7
33	Perform landscaping	32	1	2	2	2
34	Perform site clean up	33	1	1	2	1
35	Perform building inspection	34	0.5	1	2	1

36	Formally handover project deliverable to client	35	0.5	1	1	1
37	Update lessons learnt	36	1	2	4	2
	TOTAL		**159**	**236**	**318**	**237**

Table 4-4. Activity List Sequence

Activity ID	Description	Predecessor
1	Collect Requirements	NA
2	Review architectural design	1
3	Perform site visit	2
4	Conduct cost analysis	3
5	Review project budget with client	4
6	Develop project charter	5
7	Project charter review & approved by client	6
8	Site clearing	7
9	Setting out	8
10	Perform excavation	9
11	Termite Treatment	10
12	Block work	11
13	Backfill and compaction	12
14	1st Phase plumbing & electrical	13
15	Install BRC	14
16	Cast concrete flooring	15
17	Block work	16
18	Install balusters	17
19	Install second Phase plumbing & electrical	16
20	Form work for boxing	17, 19
21	Plait & install steel	20
22	Casting	21
23	Install rafters & ridge board	22
24	Install laths, galvanize & plywood	23
25	Guttering	24
26	Install windows, doors & vents	25
27	Plastering	26

28	Third phase plumbing and electrical fitting	27
29	Installation of kitchen counter & closet	28
30	Tiling	29
31	Painting	30
32	Construct retaining wall	31
33	Perform landscaping	32
34	Perform site clean up	33
35	Perform building inspection	34
36	Formally handover project deliverable to client	35
37	Update lessons learnt	36

List of Non-working days that will be taken into consideration in planning the project schedule and the duration of work packages are week days (Saturday and Sunday), in addition to holidays as listed in table 4-4:

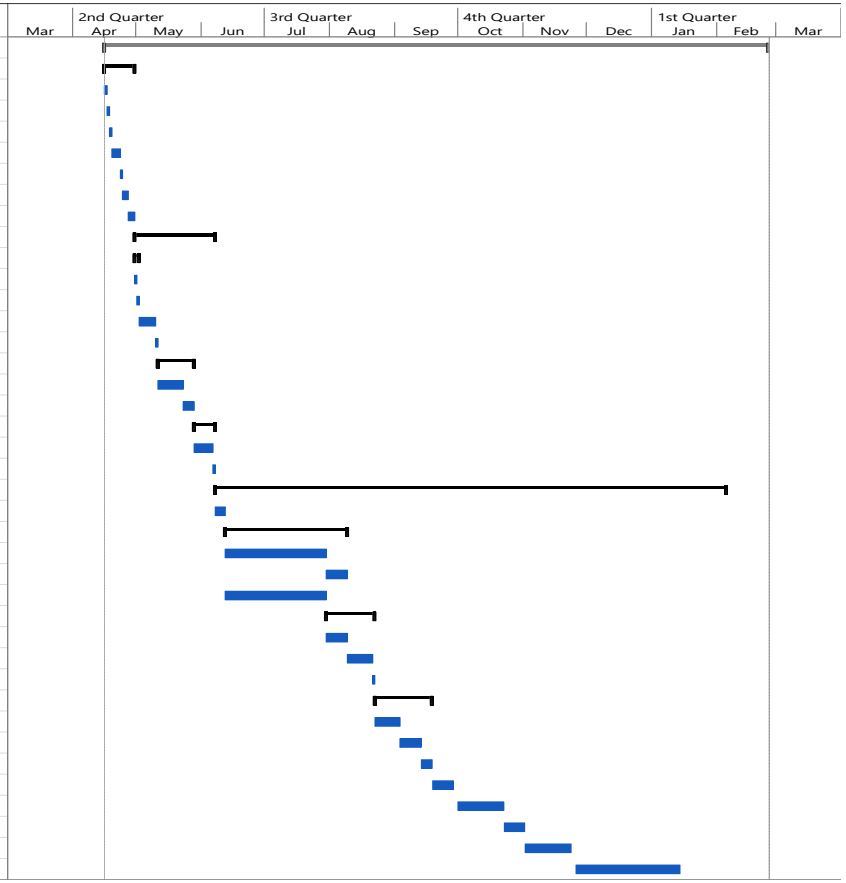
Table 4-5. List of Non-Working Days

Date	Description
Tuesday 1st May, 2018	May Day/ National Workers' Day
Tuesday 5th June, 2018	Whit Monday
Monday 9th July, 2018	Carnival Monday
Tuesday 10th July, 2018	Carnival Tuesday
Wednesday 1st August, 2018	Emancipation Day
Tuesday 25th December, 2018	Christmas Day
Wednesday 26th December, 2018	Boxing Day
Tuesday 1st January, 2019	New Years Day

ID	WBS	Task Name	Work	Duration	Start	Finish	Resource Names
0		**Sing Family Dwelling Construction Project**	**2,528 hrs**	**197 days**	**Mon 4/16/18**	**Mon 2/25/19**	
1	**1**	**Initiation Phase**	**16 hrs**	**9 days**	**Mon 4/16/18**	**Mon 4/30/18**	
2	1.1	Collect Requirements	16 hrs	1 day	Mon 4/16/18	Tue 4/17/18	Project manager,Builder
3	1.2	Review architectual design	0 hrs	1 day	Tue 4/17/18	Wed 4/18/18	
4	1.3	Peform site visit	0 hrs	1 day	Wed 4/18/18	Thu 4/19/18	
5	1.4	Conduct cost analysis	0 hrs	2 days	Thu 4/19/18	Mon 4/23/18	
6	1.5	Review project budget with client	0 hrs	1 day	Mon 4/23/18	Tue 4/24/18	
7	1.6	Develop project charter	0 hrs	2 days	Tue 4/24/18	Fri 4/27/18	
8	1.7	Project charter review & approved by client	0 hrs	1 day	Fri 4/27/18	Mon 4/30/18	
9	**2**	**Construction preparation phase**	**352 hrs**	**25 days**	**Mon 4/30/18**	**Thu 6/7/18**	
10	**2.1**	**Line-out**	**16 hrs**	**2 days**	**Mon 4/30/18**	**Wed 5/2/18**	
11	2.1.1	Site clearing	8 hrs	1 day	Mon 4/30/18	Tue 5/1/18	Foreman
12	2.1.2	Setting out	8 hrs	1 day	Tue 5/1/18	Wed 5/2/18	Foreman
13	2.2	Perform excavation	80 hrs	5 days	Wed 5/2/18	Thu 5/10/18	Labourer,Foreman
14	2.3	Termite Treatment	8 hrs	1 day	Thu 5/10/18	Fri 5/11/18	Labourer
15	**2.4**	**Construct foundation**	**160 hrs**	**10 days**	**Fri 5/11/18**	**Mon 5/28/18**	
16	2.4.1	Block work	112 hrs	7 days	Fri 5/11/18	Wed 5/23/18	8" Concrete blocks[150],Cement[15],5/8" Steel[6],Labourer,Sand[2],Foreman
17	2.4.2	Backfill and compaction	48 hrs	3 days	Wed 5/23/18	Mon 5/28/18	Foreman,Labourer
18	**2.5**	**Prepare for reinforce concrete slab**	**88 hrs**	**7 days**	**Mon 5/28/18**	**Thu 6/7/18**	
19	2.5.1	1st Phase plumbing & electrical	72 hrs	6 days	Mon 5/28/18	Wed 6/6/18	4" PVC Pipe[20],2" PVC Waste Pipe[20],Labourer,Trades helper,Conduit[8],Electrician[50%]
20	2.5.2	Install BRC	16 hrs	1 day	Wed 6/6/18	Thu 6/7/18	Trades helper,Labourer,BRC Reinforcment Mesh[40],Lacing wire[4],BMP Plastic[40]
21	**3**	**Construction**	**2,112 hrs**	**151 days**	**Thu 6/7/18**	**Tue 2/5/19**	
22	3.1	Cast concrete flooring	32 hrs	2 days	Thu 6/7/18	Tue 6/12/18	Labourer,Trades helper,Cement[10],Gravel[2],Sand[2]
23	**3.2**	**Install partition blocks**	**352 hrs**	**37 days**	**Tue 6/12/18**	**Thu 8/9/18**	
24	3.2.1	Block work	240 hrs	30 days	Tue 6/12/18	Mon 7/30/18	Trades helper[50%],Labourer[50%],4" Blocks[600],Cement[30],Sand[2]
25	3.2.2	Install balusters	112 hrs	7 days	Mon 7/30/18	Thu 8/9/18	Trades helper,Labourer,Sand[0.5],Cement[3]
26	3.3	Install second Phase plumbing & electrical	240 hrs	30 days	Tue 6/12/18	Mon 7/30/18	Trades helper[50%],Labourer[50%],220v Double outlet boxes[3],2 way Switches[2]
27	**3.4**	**Cast ring beam**	**240 hrs**	**15 days**	**Mon 7/30/18**	**Wed 8/22/18**	
28	3.4.1	Form work for boxing	112 hrs	7 days	Mon 7/30/18	Thu 8/9/18	Recycled Plywood[10],Trades helper,Labourer
29	3.4.2	Plait & install steel	112 hrs	7 days	Thu 8/9/18	Tue 8/21/18	Trades helper,Labourer,1/2" Reinforcement steel[6]
30	3.4.3	Casting	16 hrs	1 day	Tue 8/21/18	Wed 8/22/18	Trades helper,Labourer,Gravel[1],Sand[1],Cement[8]
31	**3.5**	**Roof installation**	**272 hrs**	**17 days**	**Wed 8/22/18**	**Tue 9/18/18**	
32	3.5.1	Install rafters & ridge board	112 hrs	7 days	Wed 8/22/18	Mon 9/3/18	Ridge Board[1],Trades helper,Labourer,2*6*20 Rafters [14],Fascia[3],Fascia & Plywood nails[4]
33	3.5.2	Install laths, galvanise & plywood	112 hrs	7 days	Mon 9/3/18	Thu 9/13/18	1*4*18 Laths[12],2*6*12 Galvanize Sheets[16],1/2"*4*8 Plywood[20],2" Screws[400],4" Galvanise Nails[4],Labourer,Trades helper
34	3.5.3	Guttering	48 hrs	3 days	Thu 9/13/18	Tue 9/18/18	Labourer,Trades helper,Guttering[4]
35	3.6	Install windows, doors & vents	112 hrs	7 days	Wed 9/19/18	Fri 9/28/18	2*2 Window[1],4*4 Window[1],5*4 Window[2],Trades helper,Labourer,Panel Doors[2]
36	3.7	Plastering	224 hrs	14 days	Mon 10/1/18	Mon 10/22/18	Sand[2],Cement[30],Trades helper,Labourer
37	3.8	Third phase plumbing and electrical fitting	56 hrs	7 days	Tue 10/23/18	Thu 11/1/18	Electrician
38	3.9	Installation of kitchen counter & closet	224 hrs	14 days	Fri 11/2/18	Fri 11/23/18	Trades helper,2*2*20 dressed pine[3],1 1/2" finishing nails[2],Wall nails[2],1/2" Plywood Sheets[2],Carpenter's Glue[1],Labourer
39	3.10	Tiling	248 hrs	31 days	Mon 11/26/18	Mon 1/14/19	12" Tiles[320],6" Tiles[300],Thin set[3],Trades helper,Grout[3]
40	3.11	Painting	112 hrs	14 days	Mon 1/14/19	Tue 2/5/19	Labourer,5 Gal Primer[3],5 Gal White Oil Paint[3]
41	**4**	**Post construction**	**48 hrs**	**9 days**	**Tue 2/5/19**	**Tue 2/19/19**	
42	4.1	Construct retaining wall	0 hrs	7 days	Tue 2/5/19	Fri 2/15/19	8" Concrete blocks[100],Cement[10],Gravel[1],Sand[1]
43	4.2	Perform landscaping	32 hrs	2 days	Fri 2/15/19	Tue 2/19/19	Labourer[200%]
44	4.3	Perform site clean up	16 hrs	1 day	Fri 2/15/19	Mon 2/18/19	Labourer[200%]
45	4.4	Perform building inspection	0 hrs	1 day	Mon 2/18/19	Tue 2/19/19	
46	**5**	**Closeout**	**0 hrs**	**3 days**	**Tue 2/19/19**	**Mon 2/25/19**	
47	5.1	Formally handover project deliverable to client	0 hrs	1 day	Tue 2/19/19	Wed 2/20/19	
48	5.2	Update lessons learnt	0 hrs	2 days	Wed 2/20/19	Mon 2/25/19	

Figure 12. Activity List, Durations & Resources

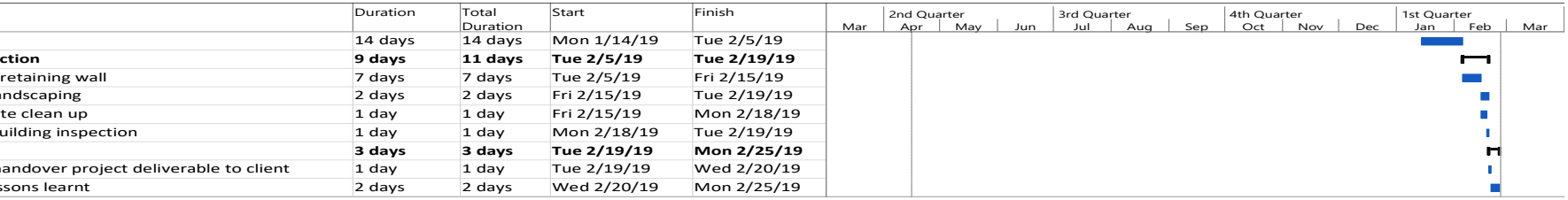
ID	WBS	Task Name	Duration	Total Duration	Start	Finish
0		**Sing Family Dwelling Construction Project**	**197 days**	**236 days**	**Mon 4/16/18**	**Mon 2/25/19**
1	**1**	**Initiation Phase**	**9 days**	**9 days**	**Mon 4/16/18**	**Mon 4/30/18**
2	1.1	Collect Requirements	1 day	1 day	Mon 4/16/18	Tue 4/17/18
3	1.2	Review architectual design	1 day	1 day	Tue 4/17/18	Wed 4/18/18
4	1.3	Peform site visit	1 day	1 day	Wed 4/18/18	Thu 4/19/18
5	1.4	Conduct cost analysis	2 days	2 days	Thu 4/19/18	Mon 4/23/18
6	1.5	Review project budget with client	1 day	1 day	Mon 4/23/18	Tue 4/24/18
7	1.6	Develop project charter	2 days	2 days	Tue 4/24/18	Fri 4/27/18
8	1.7	Project charter review & approved by client	1 day	1 day	Fri 4/27/18	Mon 4/30/18
9	**2**	**Construction preparation phase**	**25 days**	**25 days**	**Mon 4/30/18**	**Thu 6/7/18**
10	**2.1**	**Line-out**	**2 days**	**2 days**	**Mon 4/30/18**	**Wed 5/2/18**
11	2.1.1	Site clearing	1 day	1 day	Mon 4/30/18	Tue 5/1/18
12	2.1.2	Setting out	1 day	1 day	Tue 5/1/18	Wed 5/2/18
13	2.2	Perform excavation	5 days	5 days	Wed 5/2/18	Thu 5/10/18
14	2.3	Termite Treatment	1 day	1 day	Thu 5/10/18	Fri 5/11/18
15	**2.4**	**Construct foundation**	**10 days**	**10 days**	**Fri 5/11/18**	**Mon 5/28/18**
16	2.4.1	Block work	7 days	7 days	Fri 5/11/18	Wed 5/23/18
17	2.4.2	Backfill and compaction	3 days	3 days	Wed 5/23/18	Mon 5/28/18
18	**2.5**	**Prepare for reinforce concrete slab**	**7 days**	**7 days**	**Mon 5/28/18**	**Thu 6/7/18**
19	2.5.1	1st Phase plumbing & electrical	6 days	6 days	Mon 5/28/18	Wed 6/6/18
20	2.5.2	Install BRC	1 day	1 day	Wed 6/6/18	Thu 6/7/18
21	**3**	**Construction**	**151 days**	**188 days**	**Thu 6/7/18**	**Tue 2/5/19**
22	3.1	Cast concrete flooring	2 days	2 days	Thu 6/7/18	Tue 6/12/18
23	**3.2**	**Install partition blocks**	**37 days**	**37 days**	**Tue 6/12/18**	**Thu 8/9/18**
24	3.2.1	Block work	30 days	30 days	Tue 6/12/18	Mon 7/30/18
25	3.2.2	Install balusters	7 days	7 days	Mon 7/30/18	Thu 8/9/18
26	3.3	Install second Phase plumbing & electrical	30 days	30 days	Tue 6/12/18	Mon 7/30/18
27	**3.4**	**Cast ring beam**	**15 days**	**15 days**	**Mon 7/30/18**	**Wed 8/22/18**
28	3.4.1	Form work for boxing	7 days	7 days	Mon 7/30/18	Thu 8/9/18
29	3.4.2	Plait & install steel	7 days	7 days	Thu 8/9/18	Tue 8/21/18
30	3.4.3	Casting	1 day	1 day	Tue 8/21/18	Wed 8/22/18
31	**3.5**	**Roof installation**	**17 days**	**17 days**	**Wed 8/22/18**	**Tue 9/18/18**
32	3.5.1	Install rafters & ridge board	7 days	7 days	Wed 8/22/18	Mon 9/3/18
33	3.5.2	Install laths, galvanise & plywood	7 days	7 days	Mon 9/3/18	Thu 9/13/18
34	3.5.3	Guttering	3 days	3 days	Thu 9/13/18	Tue 9/18/18
35	3.6	Install windows, doors & vents	7 days	7 days	Wed 9/19/18	Fri 9/28/18
36	3.7	Plastering	14 days	14 days	Mon 10/1/18	Mon 10/22/18
37	3.8	Third phase plumbing and electrical fitting	7 days	7 days	Tue 10/23/18	Thu 11/1/18
38	3.9	Installation of kitchen counter & closet	14 days	14 days	Fri 11/2/18	Fri 11/23/18
39	3.10	Tiling	31 days	31 days	Mon 11/26/18	Mon 1/14/19



Project: Sing Family Dwelling C
Date: Wed 10/18/17

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Baseline
Baseline Milestone
Baseline Summary
Progress
Manual Progress

ID	WBS	Task Name	Duration	Total Duration	Start	Finish
40	3.11	Painting	14 days	14 days	Mon 1/14/19	Tue 2/5/19
41	**4**	**Post construction**	**9 days**	**11 days**	**Tue 2/5/19**	**Tue 2/19/19**
42	4.1	Construct retaining wall	7 days	7 days	Tue 2/5/19	Fri 2/15/19
43	4.2	Perform landscaping	2 days	2 days	Fri 2/15/19	Tue 2/19/19
44	4.3	Perform site clean up	1 day	1 day	Fri 2/15/19	Mon 2/18/19
45	4.4	Perform building inspection	1 day	1 day	Mon 2/18/19	Tue 2/19/19
46	**5**	**Closeout**	**3 days**	**3 days**	**Tue 2/19/19**	**Mon 2/25/19**
47	5.1	Formally handover project deliverable to client	1 day	1 day	Tue 2/19/19	Wed 2/20/19
48	5.2	Update lessons learnt	2 days	2 days	Wed 2/20/19	Mon 2/25/19



Project: Sing Family Dwelling C
Date: Wed 10/18/17

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Baseline
Baseline Milestone
Baseline Summary
Progress
Manual Progress

Page 2

Figure 13. Project Gnatt Chart (Source: Compiled by the author)

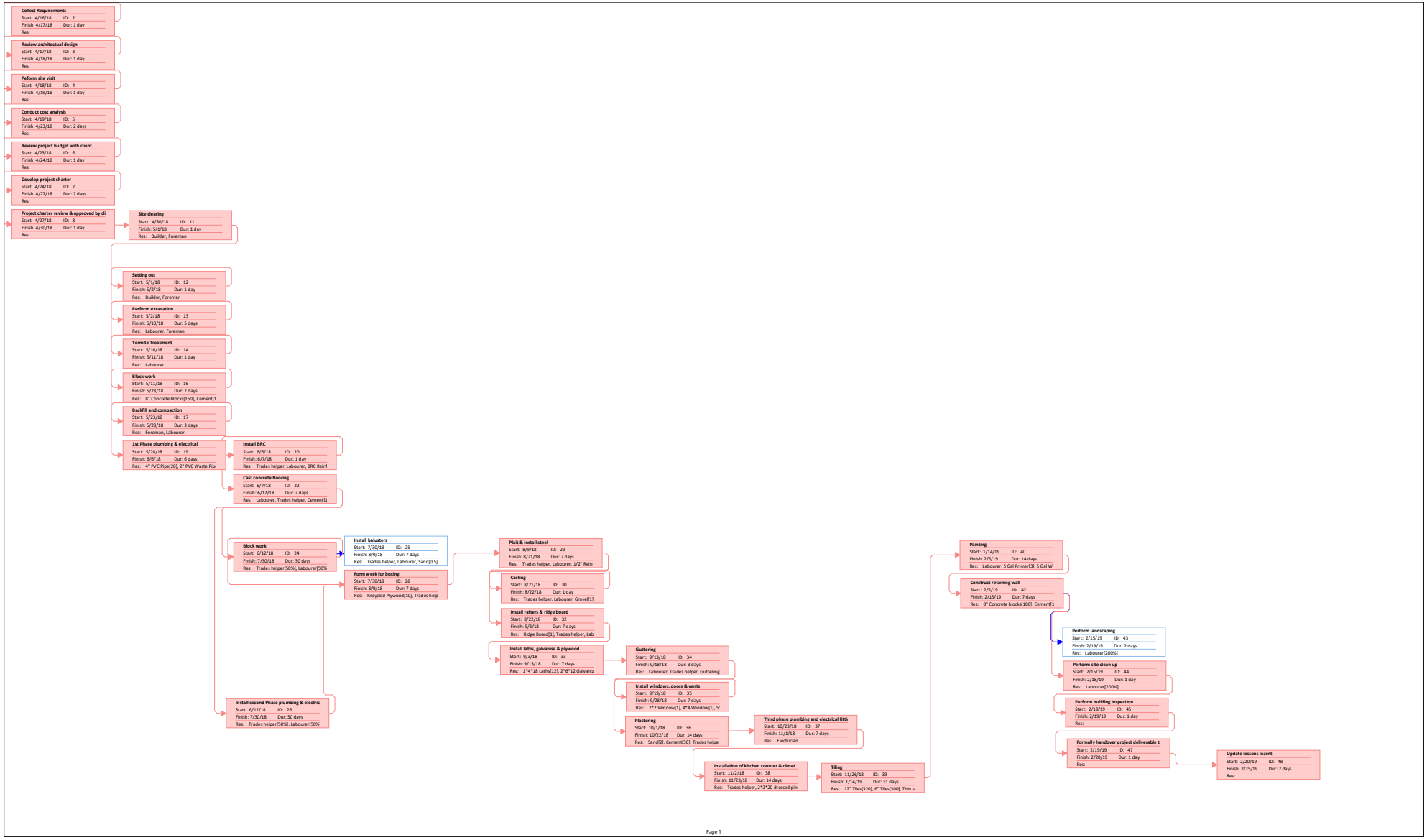


Figure 14. Network Diagram (Source: The Author)

Roles and Responsibilities

The project manager is the owner of the schedule and will be responsible for the creation of the project scheduling through the MS project 2016 tool, validation of the project schedule with the project team and stakeholders, sequencing of project activities and hosting weekly meetings with the project team. The project manager is also responsible to make aware to the project sponsor schedule progress and will either approve or reject any change requests to the schedule as presented by the project manager. The construction manager will also be responsible for monitoring the schedule and notify the project manager of any lags or leads in the project schedule. The project team will be responsible for ensuring that all assigned work packages are completed and that they attend weekly meetings are setup by the project manager to provide a status update of the assigned work packages.

Schedule Control

The project schedule control procedure follows the implementation of weekly project progress meetings that will be held to present and analyze project status reports which is based on the status of completion for work packages. A variance analysis is also performed which is used as a monitoring mechanism to assist in recognizing whether there may be deviations form the plan and seek to take corrective actions towards minimizing the risks and reverting the project back to its original schedule timeline.

Schedule Changes and Thresholds – control procedures

The end date of the project is used as a benchmark to ensure that the project does not exceed its planned scheduled time. Any changes to the project schedule will be handled and approved through the proper change control process. The relative

change must be first requested within the proper timeframe and must be analyzed first and can be approved or rejected at this stage.

4.4 Project Cost Management Plan

The subsequent project cost management plan specifies the estimated cost of the project through efficient estimating, budgeting, managing and controlling of project cost. The processes to create the project cost management plan relative to this project are to plan cost management, estimate costs, and determine budget. Again as applicable to the preceding management plans, expert judgment, and information from subsidiary plans, meetings with the client and other tools and techniques are used to develop the cost management plan. The cost management plan gives details pertaining to the major project cost categories and phase estimated costing ***Table 4-3 & 4-4***, and extended project budget chart ***Table 4-5***.

PROJECT COST MANAGEMENT PLAN

Introduction

The project cost management plan will describe how the costs of the project will be managed in accordance with the approved budget for the project. The project manager is responsible for managing the cost of the project and getting the project back on track in the event that there are any deviations. The project manager must also communicate any deviations from the budget to the project sponsor for review and the proper change control process must be followed if modifications are to be made to the budget.

The project manager is responsible for managing the cost of the project throughout its duration and to monitor that the project budget is respected. The project manager will present a budget report to the client to inform the project sponsor on cost changes if any.

The method or tools and techniques used to determine the cost of labour and materials are done through expert judgment, parametric techniques, using current

prices of materials, current labourer prices set by the company and based on purchases from pass projects.

The project budget is distributed as per tables presented below following various cost categories. The contingency reserve is distributed evenly amongst the labour costs and material costs in the construction preparation phase, construction phase and post construction phase.

Table 4-6: Major Project Costs (Source: Compiled by the author)

COST CATERGORIES	COST (XCD$)
Labour Cost	$15,148.87
Material Cost	$28, 950.00
Contractor Cost	$4,000.00
Project Manager	$2,000.00
Total Project Cost	$50,098.87
Contingency Reserve	$5,000.00

Table 4-7: Budgeted cost per project phase (Source: Complied by the author)

Name	Cost
Initiation Phase	$6,000.00
Construction preparation phase	$8,002.00
Construction	$34,924.37
Post construction	$1,172.50
Closeout	$0.00

Table 4-8: Project Budget Chart- Task Chart Overview (Source: Complied by the author)

ID	Name	Resources	Cost
1.1	Collect Requirements	Project Manager, Builder	$6,000.00
1.2	Review architectural design	Project Manager, Builder	
1.3	Perform site visit	Project Manager, Builder	
1.4	Conduct cost analysis	Project Manager, Builder	
1.5	Review project budget with client	Project Manager, Builder	
1.6	Develop project charter	Project Manager, Builder	
1.7	Project charter review & approved by client	Project Manager, Builder	
2.1.1	Site clearing	Foreman	$100.00
2.1.2	Setting out	Foreman	$100.00
2.2	Perform excavation	Labourer, Foreman	$750.00
2.3	Termite Treatment	Labourer	$50.00
2.4.1	Block work	8" Concrete blocks, Cement, 5/8" Steel, Labourer, Sand, Foreman	$2,445.60
2.4.2	Backfill and compaction	Labourer, Foreman	$450.00
2.5.1	1st Phase plumbing & electrical	4" PVC Pipe, 2" PVC Waste pipe, Labourer, Trades helper, Conduit, Electrician	$3,314.60
2.5.2	Install BRC	Trades helper, Labourer, BRC Reinforcement Mesh, Lacing wire, BMP Plastic	$791.80

3.1	Cast concrete flooring	Labourer, Trades helper, Cement, Gravel, Sand	$845.00
3.2.1	Block work	Trades helper, Labourer, 4" Blocks, Cement, Sand	$4,455.00
3.2.2	Install balusters	Trades helper, Labourer, Sand, Cement	$987.50
3.3	Install second Phase plumbing & electrical	Trades helper, Labourer, 220v Double outlet boxes, 2 way switches	$1,927.25
3.4.1	Form work for boxing	Recycled Plywood, Trades helper, Labourer	$875.00
3.4.2	Plait & install steel	Trades helper, Labourer, 1/2" Reinforcement steel	$983.96
3.4.3	Casting	Trades helper, Gravel, Sand, Cement	$497.50
3.5.1	Install rafters & ridge board	Ridge board, Trades helper, Labourer, 2x6x20 Rafters, Fascia board & Plywood nails	$2,531.15
3.5.2	Install laths, galvanize & plywood	1x4x18 Laths, 2x6x16 Galvanize sheets, 1/2x4x8 plywood, Screws, Galvanize nails, Labourer, Trades helper	$5,846.40
3.5.3	Guttering	Labourer, Trades helper, Guttering	$459.00
3.6	Install windows, doors & vents	2x2 window, 4x4 window, 5x4 window, Trades helper, Labourer, Panel doors	$2,659.80
3.7	Plastering	Sand, Cement, Trades helper, Labourer	$2,650.00

3.8	Third phase plumbing and electrical fitting	Electrician	$1,500.00
3.9	Installation of kitchen counter & closet	Trades helper, 2x2x20 dressed pine, 1 1/2" Finishing nails, wall nails, 1/2" Plywood sheets, Carpenter's glue, Labourer	$2,101.16
3.10	Tiling	12" Tiles, 6" Tiles, Thin set, Trades helper, Grout	$3,883.65
3.11	Painting	Labourer, 5 Gal Primer, 5 Gal White Oil Paint	$2,722.00
4.1	Construct retaining wall	8" Concrete Blocks, Cement, Gravel, Sand	$872.50
4.2	Perform landscaping	Labourer	$200.00
4.3	Perform site clean up	Labourer	$100.00
4.4	Perform building inspection	Builder, Project Manager	$0.00
5.1	Formally handover project deliverable to client	Builder, Project Manager	$0.00
5.2	Update lessons learnt	Builder, Project Manager	$0.00
		Total Project Cost	**$50,098.87**

Roles and Responsibilities

The project sponsor's role is to supply financial resources to the project and is the main authority on all cost changes in excess of XCD$1,000. The project sponsor is the main authority on all cost changes relative to the rejection or approval of any changes to the cost management plan. The project manager is responsible for the development of all change control procedures. The project manager is responsible for holding weekly review or status meetings and presenting all change control options or alternatives to the sponsor for approval and for generally updating the sponsor on project changes and progress in relation to costs.

Measuring Project Budget

Earned value management will be applied to measuring the cost of the project, and for the controlling of the project cost. The earned value measurements that will be used to capture the project costs are:

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

A SPI greater than 1 will indicate that the project is ahead of schedule, equivalent to 1 signifies that the project is on schedule and less than one indicates that the project is behind schedule. Whilst for CPI, a value greater than 1 reveals an under planned cost, value equal to 1 denotes on planned costs and less than 1 signifies over planned costs.

Project Management software, MS Project 2016 will be utilized to assist in measuring the project cost.

Cost Change Control Procedures

The cost change control process monitors the actual cost of the project against the planned or baseline costs of the project in order to identify variations and to plan corrective measures to minimize the relative risks. The tool used to monitor this change is the Project Management 2016 software to manage the project cost against the approved project budget set out by the project sponsor by plotting the actual expenditure of the project against the forecast. To avoid large cost variances, the cost forecast in based on actual costing of commodities and in the event of any changes by the supplier, prices changes should not be significant. Updates on work packages will be undertaken to ensure that all grounds are covered and resources accounted for. Making changes to the cost management plan will follow the prescribed change control process and must be approved by the project sponsor with the habit of ensuring that one cost increase should be offset by a cost saving in another area of the project.

4.5 Project Quality Management Plan

The subsequent project quality management plan includes processes necessary to guarantee the quality of the deliverables through policies, objectives etc. that are put in lace by the company. The processes to create the project quality management plan relative to this project are to plan quality management. The quality management plan provides particulars pertaining to the quality approach and requirements, quality assurance, quality metrics ***Table 4-6***, and quality checklist ***Table 4-7***. Templates of which were adapted and developed from those provided on Project Management Docs.com.

PROJECT QUALITY MANAGEMENT PLAN

Introduction

The project quality management plan will act as a guide on how quality will be manage throughout the project and assist the project team in executing the prescribed quality policies of the company on the project to guarantee quality process and procedures. The goal of the quality management plan is to ultimately prevent impending quality concerns to the project and to derive customer satisfaction through proper evaluation of customer requirements to met expectations.

Quality Approach and Requirements

The quality requirements for both the product and the process for this project are primarily determined by the building codes set out by the government of Saint Vincent and the Grenadines.

The Saint Vincent and the Grenadines Building Guidelines relate to the “design and construction or new residential or retail commercial buildings containing not more than 2500 square feet of gross floor area and two storeys high and the

alteration, reconstruction, demolition, removal, relocation, maintenance and occupancy of such existing buildings or any appurtenances connected or attached to such buildings or structures" (Saint Vincent and the Grenadines Building Guidelines, 2008).

In addition to the building guidelines are country legislations of which can supersede the aforementioned. They are the,

- Town and Country Planning Act (T&CP)
- Public Health act and Regulations
- Electricity Supply Act
- Fire Brigade Act
- Central Water and Sewage Authority Act
- St. Vincent and the Grenadines Building Regulations
- Standards Act

The project team, particularly the project manager, also determines the quality of the product or the project deliverable. There are responsible for ensuring that each material used is up to the required standard that is through the predefined policies of the company and expert judgment, and to ultimately certify that the client's requests are met. Comparably is the process of he project, which is all work undertaken to ensure the successful delivery of the product.

The contract and minutes of meetings conducted with the client is first reviewed and analyzed to establish prerequisites. The proceeding work is then analyzed inclusive of the resources (organizational components), in addition to the end users of the product and analyzing finally the process.

The subsequent building codes established by Saint Vincent and the Grenadines Building Regulations 2008 are guidelines that will be used to ensure the quality of the project and the materials to be used on the project to ensure that they are according to the set standards.

BRITISH STANDARDS AND CODES APPLICABLE

Item	Code No. Or Standard	Description
A2	BS 373	Testing small clear specimens of timber
A4	BS 497	Manhole covers, road gully gratings and frames for Drainage purposes
A5	BS 5911	Precast concrete pipes, fittings and ancillary products
A6	BS 648	Schedule of weights of building materials
A8	BS 8004:1986	Code of practice for foundations
A13	BS1200	Sand for mortar for plain and reinforced brickwork, block Walling and masonry
A23	BS 1881	Methods of testing concrete
A24	BS 5135	Arc welding of steels
A24	BS2994	Cold rolled steel sections
A30	BS 4360	Specification for weldable structural steels
A31	BS4482	Hard drawn steel wire for the reinforcement of concrete
A32	BS 4483	Steel fabric for the reinforcement of concrete
A33	BS 8000 Part 3	Code of practice for masonry
A38	BS 8110	The structural use of concrete in buildings
A41	BS 8000 Part 3	Code of practice for masonry
A42	BS 8000 Part 2	Code of practice for concrete work

U.S. AGENCIES

Designation	Institution
ACI	American Concrete Institute
AITC	American Institute of Timber Construction Inc.

AISC	American Institute of Steel Construction Inc.
ANSI	American National Standards Institute
AISI	American Iron and Steel Institute
APA	American Plywood Association
ASTM	American Society for Testing and Materials
AWS	American Welding Society, Inc.
NBS	National Bureau of Standards
NFiPA	National Fire Protection Association
NPA	National Particleboard Association
SJI	Steel Joists Institute
TPI	Truss Plate Institute
AWPB	American Wood Preserves Bureau

BRITISH STANDARDS AND CODES APPLICABLE

Item	Code No.	Description
B1	ACI 318	Building code requirements for reinforced concrete
B3	ACI 530-92	Building code requirements for concrete masonry structures
B5	ANSIA41.1	Standard requirements for reinforced masonry
B7	NLMA	National design specification for stress grade lumber and its Fastenings

OTHER CODES

C1	Caribbean Uniform Building Code (CUBiC)
C2	National Building Code of Jamaica
C3	Standard Building Code
C4	South Florida Building Code
C5	Bahamas Building Code
C6	National Building Code of Canada

Roles and Responsibilities

Roles	Responsibilities
Project Manager	• Project review • Quality mentoring • Develop quality management plan • Schedule weekly progress and performance meetings • Make regular quality checks or quality audits
Project Sponsor	• Define quality requirements or specifications
Contractor/ Builder	• Develop quality standards or policies for guaranteeing quality to the client. • Supervise sub-contractors • Inspect ongoing and completed work packages • Ensure requirements are fulfilled • Ensure all necessary planning is complete and activities accounted for.

Quality Assurance

This element of the project quality management plan is developed to ensure conformity to the project requirements by utilizing different metrics to measure conformance to requirements.

Metrics:

- Schedule (Completion dates)
- Allocated resources

- Budget
- Quality (Defects, Rework, Material wastage)
- Customer satisfaction

Table 4-9: Quality Metrics Template. Adapted from: Project Management Docs.com)

Metric	Standard	Testing Frequency	Acceptance Criteria
Allocated Resources:			
Concrete Blocks	SVG Building guidelines	On delivery	Absence of cracks, straight edges and soundness.
Backfill	SVG Building guidelines	Prior to use in the absence of material certification	Minimal moisture content, 90% density. Deep areas compacted with approved materials 1:3:6 by volume.
Material Waste	Less than 1% based on total material used	Per milestone	Material cannot be re-allocated and/ is below 1% mark.

Table 4-10: Quality Checklist Template. Adapted from Project Management Docs.

Quality Checklist					
Project:				**Date:**	
	Verification				
Quality Item	**Yes**	**No**	**N/A**	**Date**	**Comments**
Does the project have an approved quality management plan?					
Has the quality management plan been reviewed by all stakeholders?					
Do all stakeholders have access to the quality management plan?					
Is the quality management plan consistent with the rest of the overall project plan?					
Have product quality metrics been established, reviewed, and agreed upon?					
Have process quality metrics been established, reviewed, and agreed upon?					
Do all metrics support a quality standard which is acceptable to the customer?					
Do all metrics have agreed upon collection mechanisms?					
Do all metrics have an agreed upon collection frequency?					
Have quality metrics review meetings been scheduled throughout the project's duration?					
Are all metrics clear, measurable, controllable, and reportable?					
Is the project team familiar with the project's quality review process?					

Does the project have an appropriate number of resources assigned for quality assurance and control?					
Has the project team established a repository for all quality documentation?					
Do all team members have access to the quality documentation repository?					
Have all appropriate team members been notified of their required participation in quality reviews?					
Have quality responsibilities been assigned and documented and the applicable personnel notified?					
Have product and process quality standards been established, documented, and communicated?					
Have quality thresholds and limits been established, documented, and communicated?					
Does the change control process accommodate project changes based on quality improvements?					
Has a project quality manager been assigned?					
Is the project sponsor aware of his/her responsibilities relating to quality acceptance?					
Is the customer aware of his/her responsibilities relating to quality acceptance?					

4.6 Project Human Resource Management Plan

The subsequent project human resource management plan ensures that all labour or human resource required from the completion of the project is provided for and is available for use. These processes are responsible for the organization, managing and leading of the project team. The process to create the project human resource management plan relative to this project is to plan human resource management. The human resource management plan specifies the roles and responsibilities of the team, the organizational chart ***Figure 15***, responsibility assignment matrix (RACI) ***Table 4-8*** and staff acquisitions.

PROJECT HUMAN RESOURCE MANAGEMENT PLAN

Introduction

The project human resource management plan will encompass all the processes necessary towards the successful execution of the project. The plans will detail how the project will be managed and whether are sufficient resources to complete the project. Taking into account the necessary skill sets and knowledge that each human resource has to contribute to the project. The plan will encompass how roles and responsibilities will be spread throughout the project life cycle and how staff will be acquisitioned. The project is also expected to comply with the health and safety regulations applicable to the works and the site in relation to all employees.

In reflection of the current roles of the employees and employer and the size of the company many of the roles are fulfilled by one person. The human resources required will be provided in in accordance to their need on the project.

Roles and Responsibilities

- Project Manager

  The project manager gives the final approval on the project team assembly, has the authority to approve resources and approves estimates. The project manager is responsible for the overall management of the project. They ensure that the project is delivered as scheduled and within the prescribed budget. The project manager has to be accountable to stakeholders through the provision of monthly reports of project progress and is also responsible for the assignment of work packages.

- Office Administrator

  The office administrator performs payroll functions, that are ensuring that all employees are correctly compensated for work completed. They are responsible for the payment of bills owed by the company.

- Contractor

  The contractor has the authority to request resources, assembles the project team and is responsible for the management and supervision of the construction team. He ensures that the work packages are completed and request salaries for the work force.

- Foreman

  The foreman is responsible for carrying out specific construction duties in the absence of the contractor. This person acts as the supervisor and head over his team.

- Sub-contractors

  Sub-contractors are outsourced professionals hired to perform specific tasks. The sub-contractors hired for this job is the electrician who is responsible for the connection of the electricity.

- Architect

  The architect is responsible for drafting the drawing for the project. There are responsible for ensuring that the project manager has a clear understanding of what is required by the client based on the approved drawings and that all measurements and scales used at correct.

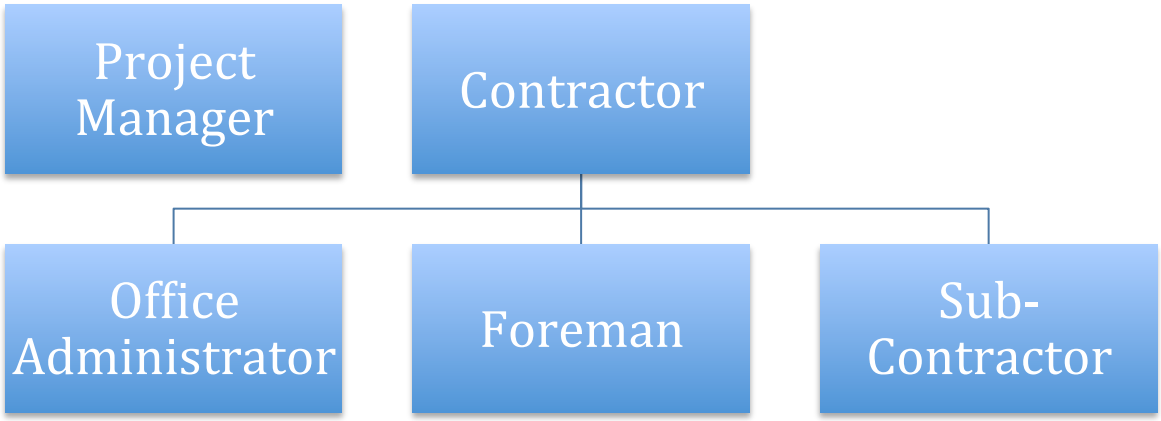


Figure 15. Organizational Chart (Source: Complied by the author)

Responsibility Assignment Matrix (RACI Chart)

Table 4-11. Responsibility Assignment Matrix (RACI). (Source: Complied by the author)

WBS	ACTIVITY	PROJECT MANAGER	OFFICE ADMINISTRATOR	CONTRACTOR	FOREMAN	SUB-CONTRACTORS
1.1.1	Collect Requirements from Client	A		C		
1.1.2	Review Architectural Design	C		A	C	C
1.1.3	Perform Site Visit	C	I	R		
1.1.4	Conduct Cost Analysis	A		C		
1.1.5	Review Project Budget with the Client	A		C		
1.1.6	Develop Project Charter	A		C		
1.1.7	Project Charter Review & Approved by Client	A		C		
1.2.1	Line-out	I	I	A	R	
1.2.2	Perform Excavation	I		A	R	
1.2.3	Treat for Pests	I		A	R	
1.2.4	Prepare Foundation	I		A	R	
1.2.5	Prepare for Reinforce Floor Slab	I		A	R	C
1.3.1	Cast Flooring	I		A	R	
1.3.2	Install Partition Blocks	I		A	R	
1.3.3	Install Second Phase Plumbing	I		A	C	R
1.3.4	Cast Ring Beam	I		A	R	
1.3.5	Roof Installation	I		A	R	
1.3.6	Install Windows, Doors, vents	I		A	R	
1.3.7	Plastering	I		A	R	
1.3.8	Third Phase Plumbing & Electrical	I		A	C	R

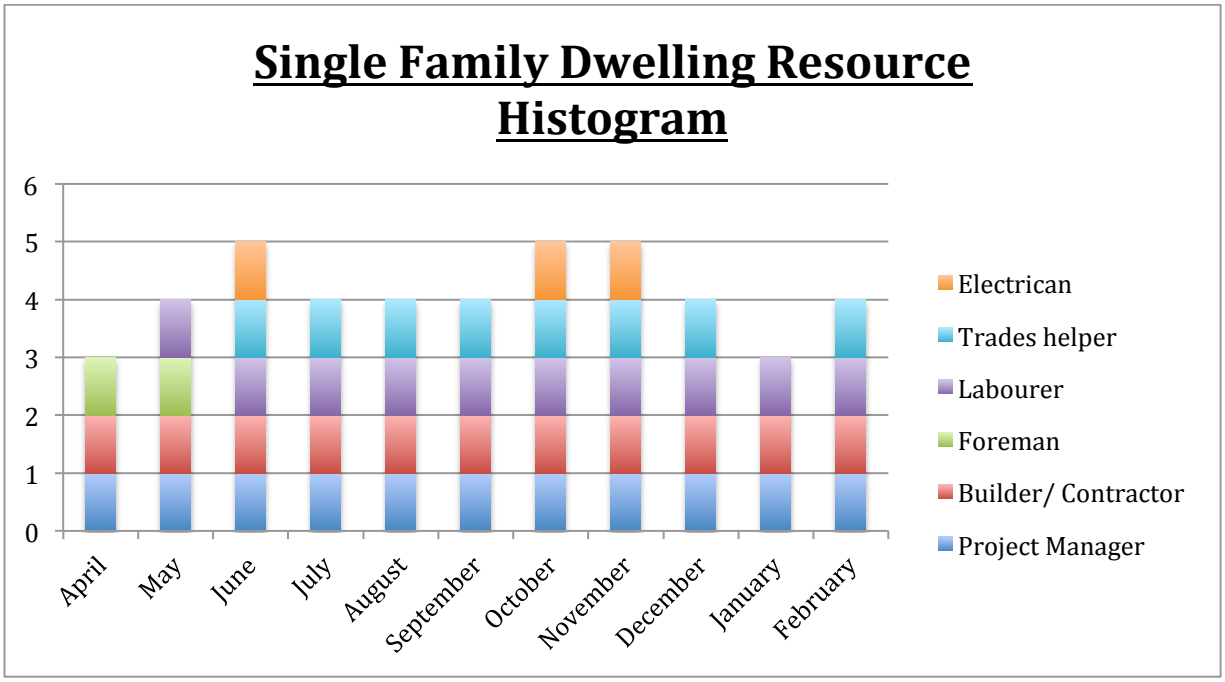
	Fitting					
1.3.9	Installation of Kitchen Counter & Closet	I		A	R	
1.3.10	Tiling	I		A	R	
1.3.11	Painting	I		A	R	
1.4.1	Construct Retaining Wall	I		A	R	
1.4.2	Perform Landscaping	I		A	R	
1.4.3	Perform Site Clean Up	I		A	R	
1.4.4	Perform Building Inspection	C		A	I	
1.5	Closeout	A	I	C	I	
1.5.1	Formally Handover Project Deliverable to Client	A		C	I	
1.5.2	Update Lessons Learned	A		I		

R = Responsibility A = Accountable C = Consult I = Inform

Staff Acquisition

The labour required for the project will be sourced internally with the exception of the project manager and sub-contractors such as the electrician of which will be hired specifically for this contract and is selected in advance or pre-assigned

The project is scheduled to commence on the 30th of April 2018. Selection and appointment of the project is required to be completed within one month's time before the project is schedule to start.



Staff Release

The construction of the Single Family Dwelling apartment project will span for a total of 8 months approximately 236 days, non inclusive of holidays, and weekends through out that period. All resources necessary for the completion of the project are secured before the project commences. All human resource requirements are identified by the contractor, approved by the project manager and then assigned to packages. The human resource histogram for the project shown below illustrates the quantity and month required for each labour related resource. The foremen are required for the first two months during the construction stage and are released upon the third month of construction, after which construction labour requirements are steady, with the exception of the electrician who is requested and released as needed for the first, second and third stage electrical task. In the event of any absences/ leaves, the contractor is responsible for ensuring that outstanding tasks or activities are turned over to the next appropriate personnel within a suitable timeframe to avoid schedule delays. Upon completion of all practical project work,

the project manager and contractor having fulfilled their contractual obligations all necessary information pertaining to the project is handed over to the client and the project team is released.

Staff Training

The contractor is responsible for ensuring that all employees in relation to the project are trained and equipped in preparation to fulfill all project requirements and similarly so for subcontractors who are also responsible for the training of their staff. The subcontractors must provide credentials of the required competencies to complete project requirements.

Performance Review

The team will be appraised on a monthly basis by evaluating work performance reports of the actual project status against the forecasted project status in addition through general observation by both the contractor and project manager.

Recognition and Rewards

Members of the team will be rewarded based on impeccable work and craftsmanship and compensated for additional hours on the project if so inclined. An end of year bonus will also be given to employees to keep the team motivated.

Regulations and Standards

The regulations and standards adhered to by the company are the labour laws of the country which must be carried out by the project manager and contractor in order to ensure that thee are no infractions and that all existing labour issues are dealt with in a swift and lawful manner.

Safety

The project manager must ensure that health and safety are of paramount importance to the team in order to mitigate the risk of causalities. A health and safety plan will be implemented, where workers will receive brief and reinforced training on work site precautions on introduction to the work site, in addition to the wearing of safety gear.

4.7 Project Communications Management Plan

The subsequent project communication management plan ensures that all required and necessary project information is disseminated to the right persons or stakeholders at the right time. These processes are responsible for the planning, collection, storage etc. of project information communicated by the project manager and team. The process to create the project communication management plan relative to this project is to plan communication management, which features the development of an appropriate strategy for communicating project reports. The communication management plan specifies the stakeholder communication requirements write-up, the communication restraints, types of communication and the communication channels ***Table 4-9***.

PROJECT COMMUNICATIONS MANAGEMENT PLAN

Introduction

The project communication management plan is critical in determining how information pertaining to the project will be disseminated to the identified stakeholders. Essentially, it helps to define the appropriate communication approach to be taken throughout the life cycle of the project.

Through the use of the appropriate communication model, it will identify the most efficient and effect approach to communicate to all stakeholders involved in relation to applicable communication methods, the frequency of distribution, and the audience. Weekly meetings will be conducted with the team to discuss relevant project matters and to discuss project updates.

Stakeholder Communication requirements

- The Sponsor

The sponsor of the project will require communication monthly progress or project status reports, budget reports, project deliverables, project performance, project expenditures, project risks and project completion. The sponsor may relay information regarding change requests relative to scope etc.

- The Company/ Contractor “Hopey Construction”

This is the company that is responsible for the construction and implementation of the project deliverable. The company is to receive communication on the project deliverables, project start date, project status, change requests, budget restrictions and project completion.

- The Neighborhood

Neighbors in close proximately, that is within a 50 ft. radius of the project is a total of four (4) households. They are required to know the project deliverable and the start date of the project to account for a disturbance that may occur.

- The Project Team

The project team is to receive information on the staffing, project deliverables, project completion, project start date, project status, change requests, project expenditure, procurement information, and lessons learnt.

- The Local Financial Institution

The local financial institution will receive information regarding the project proposal, project deliverables, project expenditure, project start date and project budget. They will in return provide information concerning the approval of funding and any terms and conditions that may be applied to the provision of funds.

- The Project Manager

The project manager is expected to communicate project deliverables, project completion, project start date, project status, change requests, project expenditure, procurement information, and lessons learnt.

- Material Suppliers

The material suppliers will be accountable for the provision of the necessary materials that will be outsourced. They will require information on procurement information, project deliverables and resource calendar or timeline as to when resources are required for use.

- The sub-Contractors

The sub-contractors will need to be communicated on the project deliverables, project status, and project start date to ascertain when services will be required.

- The Government Agencies

Government agencies such as the Central Sewage and Water Authority (CWSA), and St. Vincent Electricity Services (VINLEC) require communication on the project to make the necessary connections for light and water. Communication required is the project deliverable, project start date and project completion.

- The Non- Governmental Agencies

Non-governmental agencies such as FLOW will require appropriate communication towards the connection for telecommunication services. Communication required is the project deliverable, project start date and project completion.

Communication Constraints

There are various constraints that may hinder the effective communication of the necessary project information such as:

- Time constraints - strict time constraints can make information time sensitive. Information needs to be distributed in a timely manner in order for it to be useful to the project and effective.
- Type of technology – attention must be paid to the tools used to communicate project information; it must be universal or compatible across all devices.

Type of Communication

The types of communication that will be utilized for this project are a combination of formal and informal written and verbal communication.

Formal written Communication – Emails, memos, letters, project documents

Informal written communication – Emails, text messages (SMS)

Formal verbal Communication – Meetings

Informal verbal Communication – Meetings, telephone dialogue

Channels of Communication

Table 4-12: Communication Channels. (Source: Compiled by author)

STAKEHOLDERS	COMMUNICATION SCHEDULE	MEDIUM
Sponsor	Weekly	Email, face to face communication
Contractor	Weekly	Email, face to face communication
The Neighborhood	Need to know basis	Face to face
Project team	Weekly	Email, face to face communication
Local financial institution	By request	Meetings, project documents
Project manager	Weekly	Email, face to face communication, telephone dialogue, project documents
Material suppliers	Monthly	Email, face to face communication, telephone dialogue
Sub-contractor	Need to know basis	Email, face to face communication, telephone dialogue
Government agencies	Need to know basis	Email, face to face communication, telephone dialogue
Non-governmental agencies	Need to know basis	Email, face to face communication, telephone dialogue

Table 4-13: Communication Matrix

Communication Type	Objective of Communication	Medium	Frequency	Audience	Owner	Deliverable	Format
Project status meetings	Report on current project progress	Face to face	Weekly	Project team	Project Manager	Project Status Reports	Meeting
Budget forecast meetings	Identify how funds will be allocated during the life of the project. Estimate project cost.	Face to face, emails, printed documents	Weekly	Project sponsor, project team	Project manager	Budget Forecast	Meetings, electronic document, printed documents
Change Control Board meetings	Identify current change requests, approve or reject changes	Face to Face, formal written	As needed	Project team, project sponsor	Project Manager	Change Request Report	Meeting, electronic document, printed documents

4.8 Project Risk Management Plan

The subsequent project risk management plan assists in accounting for, managing and control of innate risks to the project. These processes are liable for the proper identification, analysis, and management and controlling of those risks identified. The processes to create the project risk management plan relative to this project are to plan risk management, identify risks, perform qualitative and quantitative risk analysis and plan risk response. The risk management plan details the risk management approach, the risk breakdown structure (RBS) ***Figure 16***, the probability and impact scales ***Table 4-10, 4-11 & 4-12*** and the risk register ***Table 4-13***. Charts seen as indicated are derived from and adapted from the PMBOK Guide© 5th Edition.

PROJECT RISK MANAGEMENT PLAN

Introduction

The project risk management plan will feature all activities for the management of risks, which will involve the planning, identification, analyzing, risk response planning and monitoring and controlling of project risks. Due to the nature of projects, they are susceptible to innumerable risks therefore these inherent risks must be identified and a strategy developed manage the impact of each uncertainty. The process of risk identification for this project is established through lessons learned from previous projects similar in nature and expert judgment.

Risk Management Approach

The approach to managing risks is through the use of tools such as the risk breakdown structure, and the risk register. Risks within the risk breakdown

structure have been identified and categorized under four major risk categories adapted from PMBOK Guide© 5th Edition as listed:

1. Technical Risks
2. External Risks
3. Organizational Risks
4. Project Management Risks

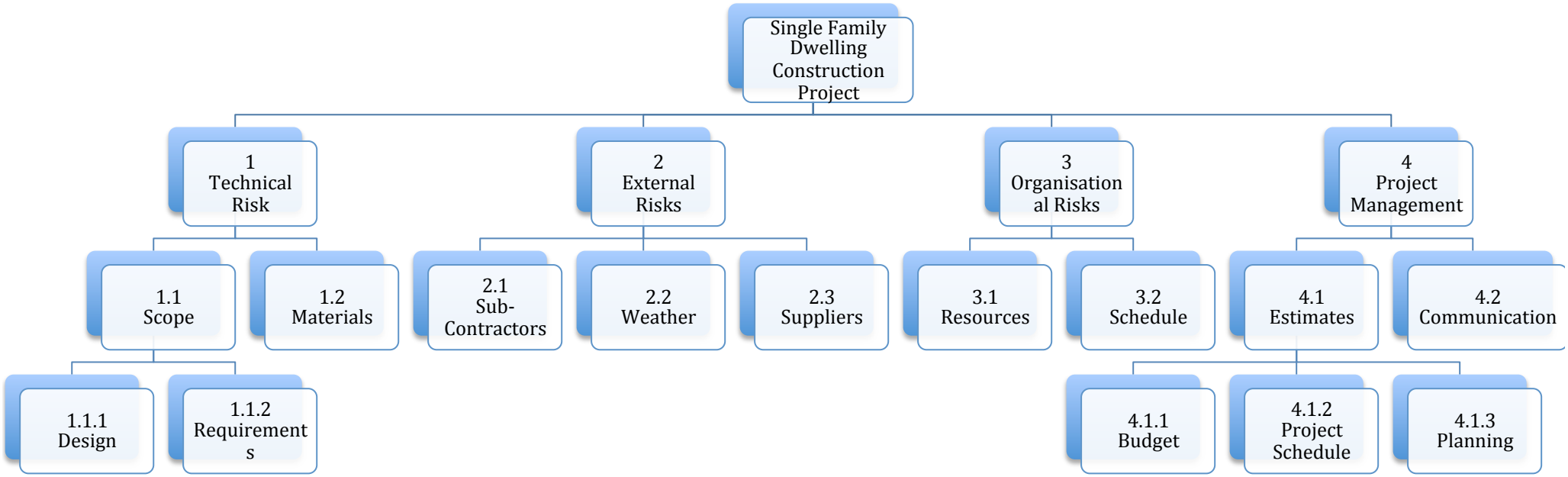


Figure 16. Risk Breakdown Structure. Adapted from: PMBOK Guide© 5th Edition

PROBABILITY AND IMPACT SCALES

Table 4-14. Probability and Impact Matrix (Source: Complied by the author)

PROBABILITY	THREATS				
0.80	0.04	0.08	0.12	0.16	0.20
0.60	0.03	0.06	0.09	0.12	0.15
0.40	0.02	0.04	0.06	0.08	0.10
0.20	0.01	0.02	0.03	0.04	0.05
0.05	0.00	0.01	0.01	0.01	0.01
	0.05	**0.1**	**0.15**	**0.2**	**0.25**

Legend	
Low Risk	
Moderate Risk	
High Risk	

Table 4-15: Probability Scale. (Source: Compiled by the author)

PROBABILITY SCALE	CATEGORIES	DEFINITIONS
0.80	Highly Likely	>80% probability
0.60	Likely	60% - 79% probability
0.40	Moderately Likely	50%-59% probability
0.20	Unlikely	30% - 49% probability
0.05	Highly unlikely	<30% probability

Table 4-16: Impact Scale. (Source: Compiled by the author)

CATEGORIES	IMPACT SCALE				
	0.05	**0.1**	**0.15**	**0.2**	**0.25**
	Very low	Low	Moderate	High	Very High
Quality	Minimal flaws	Some flaws	Moderate flaws	High level of flaws causing rework	Severe flaws causing major rework
Scope	Insignificant changes in scope	Minimal scope changes	Average changes in scope	High level of scope changes	Significant increases in scope changes
Cost	Insignificant cost increases	Cost increases of <XCD$1K	Cost increases of XCD$2-$5K	Cost increases of XCD$6-$9K	Significant cost increases of >XCD$10K
Schedule	Completed project with minimal delay	Delay of < 1 month	Delay of 1 - 2 months	Delay of 3 - 4 months	Delay of > 5 months

Table 4-17: Risk Register. (Source: Complied by the author)

RBS CODE	RISK CATEGORY	CAUSE	RISK	CONSEQUENCE	PROBABILITY	IMPACT	P X L	TRIGGER	OWNER	MITIGATION STRATEGY
1.1	Technical	Mis-interpretation of project scope	Constant Scope changes	Increase in project cost and schedule delays	0.80	0.25	0.20	Inconsistency in planned vs. actual work	Project Manager	**Mitigate:** Develop detailed project documents to foster better understanding. Hold meetings for clarification of project scope.
1.2	Technical	Lack of due diligence in recording material requirements	Incorrect material	Replacement of materials causing increase in cost	0.40	0.20	0.08	Upon receipt of materials indicate	Procurement officer	**Avoid:** Develop detailed activity lists and account for all work package resources. Appoint a reviewer. Add a

										schedule buffer to the project.
2.1	External	Lack of due diligence taken during the selection process of sub-contractors	Unreliable sub-contractors	Delay in project schedule	0.40	0.15	0.06	Resource calendar: Sub-contractors absent on scheduled time for work	Project Manager	**Mitigation:** Review sub-contractor credentials, opt for contractors previously employed by the company that are reliable.
2.2	External	Poor weather conditions	Unproductive labour force	Project delays	0.80	0.25	0.20	Flood warnings, hurricanes / storm and heavy rain		**Accept:** add additional resources to speed up the schedule or re-schedule the project to the dry season.
2.3	External	Lack of	No	Low quality	0.40	0.10	0.04	Delayed	Procureme	**Mitigate:** Opt for

		due diligence taken in the selection of competent suppliers	response or delays from selected suppliers	products and delays in project schedule				delivery or delivery of low quality materials	nt Officer	suppliers familiar to the company, and those reputable and reliable in performance and quality.
3.1	Organizational	Staffing is sourced internally	Unavailability of resources	Delays due to insufficient resources	0.80	0.20	0.16	Resource calendar	Project Manager	**Mitigate:** Outsource lacking skills. Schedule resources based on availability.
3.2	Organizational	Lack of adequate resources	Changes in project schedule	Delays in project schedule	0.60	0.15	0.09	Resource calendar	Project Manager	**Mitigate:** Outsource critical resources based on resource calendar as needed.
4.1.1	Project Management	Budget costs	Inconclusive	Costs overrun	0.60	0.25	0.15	Continuous revision	Project Manager	**Mitigate:** Review project budget to

		underesti mated	budget estimate s					of project costs		locate cost savings, review buy/ make decisions. Utilize contingency reserve.
4.1.2	Project Management	Extension of project schedule	Inconclu sive project schedule duration estimate s	Project schedule delays	0.40	0.25	0.10	Continuou s changes in project schedule	Project Manager	**Mitigate:** Create a buffer for inconclusive project schedules, adjust schedule; crashing.
4.1.3	Project Management	Missing critical project planning elements	Inconclu sive project planning	Misunderstandin g of project scope, unplanned for project activities	0.40	0.25	0.10	Resource calendar	Project Manager	**Mitigate:** Review project documents. Create a schedule buffer for unforeseen events. Utilize contingency

										reserve.
4.2	Project Management	Lack of effective communications planning	Stakeholders not properly informed on project matters	Project may be halted	0.40	0.15	0.06	Conflict with stakeholders	Project Manager	**Mitigate:** Schedule meetings for planning stakeholder management. Assign personnel to communication matters. Re-evaluate communication matrix.

Table 4-18. Risk Summary

Risk Categories	Low Risk	Moderate Risk	High Risk	Total
Technical		1	1	2
External	1	1	1	3
Organizational		1	1	2
Project Management		1	3	4
TOTAL	**1**	**4**	**6**	**11**

4.9 Project Procurement Management Plan

The subsequent project procurement management plan assists that all purchases necessary for the completion of the project are planned for to ensure timely delivery of materials and help to justify make or buy decisions. The processes to create the project risk management plan relative to this project are to plan procurement management, and conduct procurements. The procurement management plan details the procurement listing and schedule ***Table 4-14***, make or buy decisions and procurement constraints.

PROJECT PROCUREMENT MANAGEMENT PLAN

Introduction

The project procurement management plan is developed to manage the procurement needs of the project throughout the project's life cycle. The procurement plan is instrumental in determining make or buy decisions. Here the project manager collaborates with the contractor to identify the procurement needs of the project. With the exception of items pre-purchased by the owner, a decision will be made as to whether certain items will be purchased or made, to be used on the project.

Procurement contracts relative to the building of balusters, plaiting of reinforcement steel, electrical, masonry, painting etc. will be provided under the relative labour contractual agreements. Vendors are selected based on years of experience working along with the company on past projects or expert knowledge of vendor offerings. Due to the size of the project, biding was not deemed necessary.

The project manager is expected to work along with the project team to manage procurement activities. The project manager is authorized to approve all

procurement activities of up to XCD$5,000; beyond that threshold the approval of the client is required to advance purchases.

Procurement Listing and Schedule

Table 4-19: Procurement List & Schedule. (Complied by The author)

Resource	Justification	Schedule Date
Cement	Used along with sand, water and gravel to mix concrete for construction.	11/5/2017
Concrete blocks	Used in construction of walls.	11/5/2017
BRC (wire mesh)	Reinforcing steel used in concrete construction.	28/5/2017
PVC Pipe	Plumbing and drainage installation	28/5/2017
Reinforcement Steel	Used to reinforce concrete structures.	11/5/2017
Sand	Used to mix concrete.	11/5/2017
Conduit	Used in electrical installation.	28/5/2017
Reinforce mesh	Used to reinforce concrete structures.	6/6/2017
Lacing wire	Used to bind steel together.	6/6/2017
DMP Plastic	Damp proof membrane used to prevent moisture from getting on to the flooring.	6/6/2017

Gravel	Used to make concrete.	7/6/2017
Outlet boxes	Electrical boxes used during wiring.	12/6/2017
2 way switches	Used to control electrical wiring.	12/6/2017
Plywood sheets	Used to make boxing to prepare for roof construction.	3/9/2017
Ridge board	Used to provide structure to the roof.	22/8/2017
Rafters	Used to support the roof.	22/8/2017
Fascia board	Used to support the roof.	22/8/2017
Laths	Used to support the roof.	3/9/2017
Galvanized sheets	Protect the underlying roof structure from natural elements/ covering for the concrete structure.	3/9/2017
Guttering	Used to transfer water from the foundation.	13/9/2017
Windows	Ventilation system or opening.	19/9/2017
Dressed pine	Timber used in roof construction.	2/11/2017
Panel doors	Ventilation system, opening and exit points.	19/9/2017
Finishing nails	Used to fasten or secure cabinetry.	19/9/2017
Wall nails	Used to fasten or secure cabinetry.	19/9/2017
Tiles	Used to cover bare	26/11/2017

	concrete flooring.	
Thin set	Used to bind tiles to the ground/ tile adhesive.	26/11/2017
Grout	Fill tile gaps.	26/11/2017
Primer	Used to prepare for initial painting.	14/1/2017
Oil paint	Used as a final coating	14/1/2017
Screws	Used to fasten galvanize to roof.	3/9/2017
Plywood & Galvanize nails	Used to fasten galvanize to roof.	3/9/2017

Make or Buy Decisions

Some materials required by the project will be outsourced. The balance of materials will be bought from selected vendors or have already been pre-purchased by the client in preparation for the project.

MAKE	BUY
Concrete mixture	Cement
Balusters	Sand
Box forms	Gravel
Concrete blocks	BRC wire
	PVC Pipe
	Reinforcement steel
	Conduit
	Reinforce mesh
	Lacing wire (some)
	DMP plastic

	Outlet boxes
	2 way switches
	Plywood sheets (some)
	Ridge board
	Rafters
	Fascia boards
	Laths
	Galvanized sheets
	Guttering
	Windows (some)
	Dressed pine
	Panel doors
	Finishing nails
	Wall nails
	Tiles (some)
	Thin set (some)
	Grout
	Primer (some)
	Oil paint- White
	Screws
	Plywood & galvanized nails (some)

Procurement Constraints

- Project schedule and procurement activities may not coincide
- Budget may not have much wiggle room to account for exponential increases in cost of resources or for any changes in scope that may increase the procurement needs of the project.

- Procurement activities must be inline with the project scope, the adverse may be disregarded if the scope is amended, however not through the proper change control process.

4.11 Project Stakeholder Management Plan

The subsequent project stakeholder management plan is the final plan presented. It assists identify all stakeholders relative to the project that can be impacted or impact the project either negatively or positively, analyze and develop strategies to manage each stakeholder. The processes to create the project stakeholder management plan relative to this project are to identify stakeholders and plan stakeholder management. The stakeholder management plan features the main component, which is the stakeholder register ***Table 4-15***.

PROJECT STAKEHOLDER MANAGEMENT PLAN

Introduction

The project stakeholder management plan will identify all the relative stakeholders such as as persons or organizations that have particular interest in the project and can impact the project either negatively or positively. Each stakeholder is analyzed and an appropriate strategy is developed to effectively and efficiently manage each stakeholder that is through communications.

The approach used to ensure that each stakeholder is accounted for is through the use of the stakeholder register and power/ interest index. Each stakeholder is recorded and analysis as per **Table 4-15**.

Table 4-20: Stakeholder Register. Adapted from: Project Management Docs.com

Company Name:	Hopey's Construction Company
Project Name:	Single Family Dwelling Construction Project
Prepared By:	Nikieta Mandeville (Project Manager)
Date:	16th April, 2018

ID	PRJECT STAKEHOLDER	ROLE - RESPONSIBILITY	TYPE OF STAKEHOLDER	TYPE OF COMMUNICATION	PROJECT INTEREST	IMPACT/ INFLUENCE	LEVEL OF INFLUENCE
1	Hopey's Construction Company	Contractor	Internal	Meetings, email correspondence, documents	To deliver the project according to the clients specifications and on schedule	Positive/ Influencer	High
2	Mr. Mandeville	Project sponsor	External	Meetings, Project status documents	To have the project delivered as schedule and budget.	Positive/ Influencer	High

3	Mr. Richards	Electrician- Sub contractor	External				
4	Mr. Mandeville	Architect	External	Email correspondence, project documents, meetings	To ensure that the drafted design is understood and conceptualized as intended.	Positive/ Influencer	Moderate
5	Mr. Julian Jack	Trades helper	Internal	Meetings, face to face communication, performance feedback	To perform project work as required by client	Positive/ Supporter	Low
6	Mr. Smooth	Labourer	Internal	Meetings, face to face communication, performance feedback	To perform project work as required by client	Positive/ Supporter	Low
7	Mr. Demond Jack	Foreman	Internal	Meetings, face to face communication,	To perform project work	Positive/ Supporter	Low

				performance feedback	as required by client		
8	Miss N. Hope	Administrator	Internal	Email correspondence, face to face communication, meetings	Ensure that all employees are paid and the project bills are not outstanding	Positive/ Supporter	Low
9	Gibson's Building Supplies	Supplier	External	Meetings, contracts, invoices	Provide construction materials	Positive/ Supporter	Low
10	C.W.S.A	Supplier	External	Meetings, project documentation	To connect water supply to the project	Positive/ Influencer	High
11	VINLEC	Supplier	External	Meetings, project documentation	To connect electricity to the project	Positive/ Influencer	High
12	Community	Neighbours	External	Face to face communication	To have a project	Positive/ Influencer	Moderate

					constructed according to building regulations.		
13	Planning Department	Government department	External	Project documentation, meetings	To have a project constructed according to building regulations.	Positive/ Influencer	High
14	Financial Institution	Funding Company	External	Project documentation, meetings	To provide and approve project funding	Positive/ Influencer	High

5 CONCLUSIONS

1. The project charter was formulated for the fulfillment of the first specific object. Using the headings provided in the PMBOK Guide© 5th Edition as a guideline, it was developed to formally authorize the project and to outline the objectives, purpose, business objectives, budget, assumptions, constraints, risks etc. pertaining to the project.
2. The scope management plan was formulated for the fulfillment of the second specific object. It was created to guide the project by ensuring that all work required to derive the specified project deliverable was defined and automatically excluded all work that was outside the project scope, through details relative to the scope description, scope baseline, WBS and WBS dictionary and architectural drawings.
3. To develop the schedule management plan in fulfillment of the third specific objective, the milestone lists and dates, activity listing, the duration of each activity and the resources required for each activity, the network diagram and the Gaatt chart were created in order to define what approach will be used to determine the schedule of the project. The Projects 2016 computer software was used to formulate the charts and graphs required.
4. The cost management plan was formulated for the fulfillment of the fourth specific objective. It was created to ensure that the work identified could be executed within the prescribed budget. It featured tables on the major cost categories and phases of the project, in addition to the budget chart.
5. The quality management plan was prepared in fulfillment of the fifth specific objective. It detailed how quality will be managed and maintained throughout the project through the development of the quality approach and requirements, quality assurance, quality metrics and checklist templates provided by online sources. It also focused on country building guidelines and codes.
6. The human resource management plan was formulated in fulfillment of the sixth specific objective. It specified how the human resource requirements

for the project would be effectively managed for the best optimization of resources. It included the roles and responsibilities of the project team, the organizational chart, RACI Matrix and staff acquisitions.

7. The development of the communications management plan was in fulfillment of the seventh specific objective. It was created to determine how important information developed by the project will be communicated and or distributed through stakeholder communication requirements identification, communication constraints, communication channels and types of communication relative to the project.
8. The risk management plan as prepared in fulfillment of the eight specific objective. As established, every project by nature comes with its own risks and each risk need to be identified to properly manage and prevent astronomical impacts. It detailed the risk approach, RBS, probability impact scales and risk register. Concepts and templates shown were derived from PMBOK Guide© 5th Edition, and online sources.
9. To develop the procurement management plan in fulfillment of the ninth specific objective, the procurement schedule and listing was created, in addition to determining make or buy decisions and listing procurement constraints. The procurement plan was formulated to identify purchasing needs and develop proper procurement documentation.
10. The stakeholder management plan was prepared in fulfillment of the tenth and final specific objective of the project. It was developed to identify all stakeholders relative to the project and determine their impact on the project through the stakeholder register.
11. The project management plan was produced in fulfillment of the specified general objective. It was formulated through qualitative and analytical research using PMBOK Guide© 5th Edition as a guide to provide sound planning and documentation for the construction of the single-family dwelling apartment on Hopey's construction behalf.

6 RECOMMENDATIONS

1. Hopey Construction should adapt a more formalized method of planning projects in retrospect of the current project management plan so as to increase project success. As illustrated in the project, with the proper documentation there is a baseline in place and reference point for all information pertaining to the project, resources are planned for in advance etc.
2. Hopey Construction should develop a template for the plans or documents to enable efficient and effective planning processes and to make the documentation process less taxing as all required information will be included where necessary and will be easily referenced during the project.
3. Hopey Construction should employ good project management practices to further develop projects and company standards. As alluded to previously, with existing issues such as changes in scope and financial inefficiencies on the part of the client on account of those changes, with the implementation of good PMI practices it helps the company to remain focus, and to only proceed with changes after going through the proper change control procedures.
4. Hopey Construction should develop written quality policies that can be referenced during project management.
5. Hopey Construction should invest in suitable storage systems for documentation of projects, to foster lessons learnt and to facilitate the efficiency and effectiveness of future projects planning and success.
6. Hopey Construction should employ a formal project management team as apart of the company to facilitate in proper project management practices and who will be sole dedicated to project planning especially with the ability to analysis project data and provide valuable contributions.
7. Hopey Construction should invest in additional personnel to aid in proper construction management processes and to ensure that there is consistency in planning practices and continuity.

8. Hopey Construction should invest in proper project management tools i.e. the MS Project software to assist in project planning and the consolidation of project data.
9. Hopey Construction should train personnel in relation to PMI practices to foster greater understanding as to the reason for its importance towards the health and longevity of the construction company.

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8 APPENDICES

Appendix 1: FGP Charter

PROJECT CHARTER	
Date	**Project Name:**
26th July, 2017	Project Management Plan for the Construction of a Single Family Dwelling for Hopey Construction
Knowledge Areas / Processes	**Applicacion Area (Sector / Activity)**
Knowledge areas: Integration, Scope, Schedule, Cost, Quality, Human Resources, Communication, Risk, Procurement, Stakeholder **Process groups:** Initiating, Planning	Construction
Start date	**Finish date**
26th July 2017	14th January, 2018
Project Objectives (general and specific)	
General objective: To create a project management plan for the construction of a single family dwelling for Mr. Alwyn and family in order to guide the how the project will be managed and controlled through the implementation of PMI's best practices. Specific objectives: 1. To create a scope management plan to ensure that all required project work is incorporated in order to successfully complete the project 2. To create a schedule management plan to guide the project schedule and ensure a timely delivery of the project deliverables. 3. To create a cost management plan to plan how cost relating to the project will be managed in order to avoid budget overrun. 4. To create a quality management plan to achieve the acquired standard necessary for a successful project delivery. 5. To create a human resource management plan to determine the staffing requirements during the life of the project. 6. To create a communications management plan to foster inefficient and effective communication between the client and the company. 7. To create a risk management plan that will describe how project risks will be managed and controlled in order to avoid project schedule delays and costs overrun. 8. To create a procurement management plan that will act as a guideline to manage procurements throughout the life of the project. 9. To create a stakeholder management plan to develop the stakeholder register in order to identify and help to engage the key stakeholders.	
Project purpose or justification (merit and expected results)	

The purpose of the final graduation project is to develop a project management plan to guide and manage the project through the use of good project management practices to derive successful delivery of project deliverables and increasing the success rate of the construction company whilst providing a better alternative to the traditional approach currently used.

Description of Product or Service to be generated by the Project – Project final deliverables

This document will generate a scope management plan, schedule management plan, cost management plan, quality management plan, human resource management plan, communication management plan, risk management plan, procurement management plan and stakeholder management plan.

Assumptions

The resources required will be readily available.

The project schedule dates are accurate and true.

The total cost of the project will not increase.

Project scope will remain unchanged, however any changes or updates will follow the change control approval process set out by the board.

Constraints

Short time frame to develop the management plan.

Budget must be respected to avoid overrun of cost.

Project documentation approval. Document must be approved to advance to the subsequent phase.

Preliminary risks

If there is a shortage of materials or resources (e.g.: in relation to construction guidelines in St. Vincent and the Grenadines) it might create a void in contributions to project knowledge and impact the quality of the project.

Budget

The estimated budget required for this project is USD$350.00

With a contingency amount of USD$100.00

Milestones and dates

Milestone	Start date	End date
Graduation Seminar	26th June, 2017	30th July, 2017
Tutoring Process	12th August, 2017	10th November, 2017
Reading by reviewers	13th November, 2017	1st December, 2017
Adjustments	4th December, 2017	15th December, 2017
Presentation to Board of examiners	8th January, 2017	14th January, 2018

Relevant historical information

Hopey Construction is a construction company headed by Mr. Reynold Hope who has been involved in the construction business for more than 30 years in residential and business construction. The goal of the company is to provide a quality product and satisfy the needs of its customers. The company has been contracted to construct the apartment for Mr. Alwyn and family as the company once constructed the main family dwelling and is well acquainted with and by the family.

Stakeholders

Direct stakeholders:

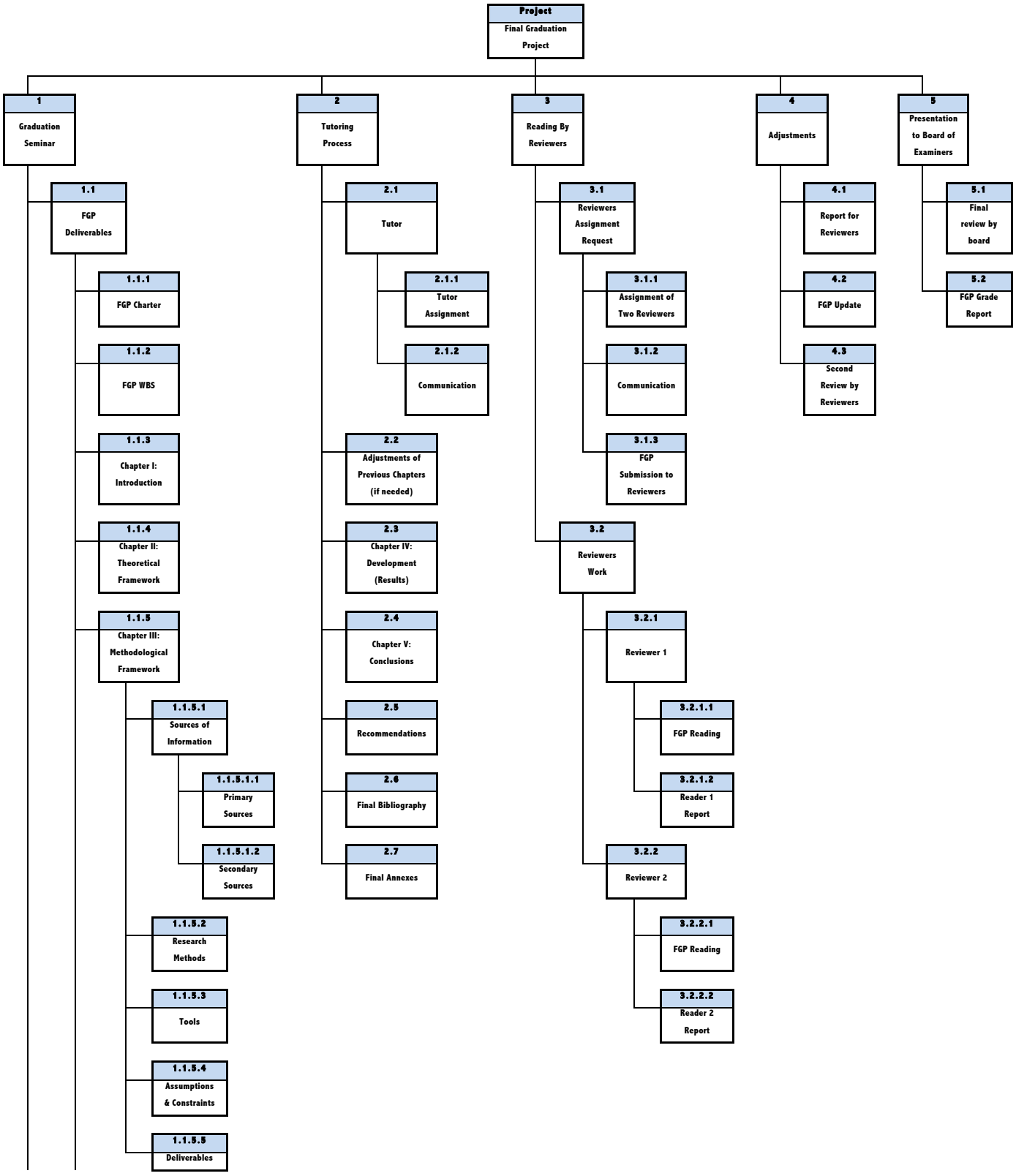
- Board of examiners
- Tutor
- Reviewers
- Course facilitator
- Nikieta Mandeville

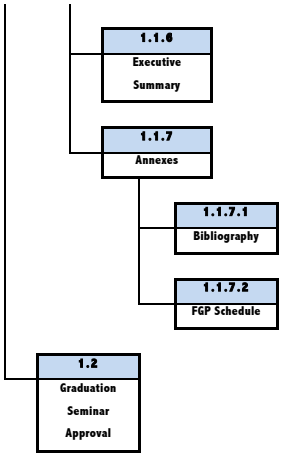
Indirect stakeholders:

- Mr. Alwyn Mandeville (Customer/ Sponsor & Architect)

Project Manager: **Nikieta Mandeville**	**Signature:** 
Authorized by:	**Signature:**

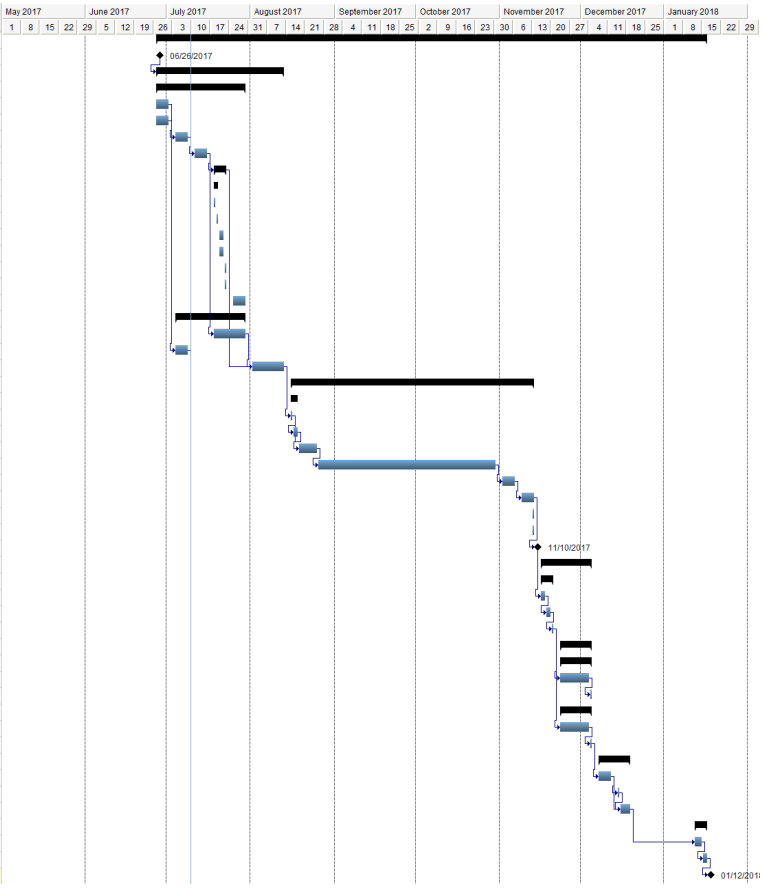
Appendix 2: FGP WBS




1.1.6
Executive
Summary
1.1.7
Annexes
1.1.7.1
Bibliography
1.1.7.2
FGP Schedule
1.2
Graduation
Seminar
Approval

Appendix 3: FGP Schedule

	Name	Duration	Start	Finish	Predecessors
1	**Final Graduation Project**	**145d**	**06/26/2017**	**01/12/2018**	
2	FGP Start	0d	06/26/2017	06/26/2017	
3	**1,Graduation Seminar**	**35d**	**06/26/2017**	**08/11/2017**	2
4	**1.1,FGP Deliverables**	**25d**	**06/26/2017**	**07/28/2017**	
5	1.1.1,Charter	5d	06/26/2017	06/30/2017	
6	1.1.2,WBS	5d	06/26/2017	06/30/2017	
7	1.1.3,Chapter I. Introduction	5d	07/03/2017	07/07/2017	5,6
8	1.1.4,Chapter II. Theoretical framework	5d	07/10/2017	07/14/2017	7,20
9	**1.1.5,Chapter III. Methodological framework**	**5d**	**07/17/2017**	**07/21/2017**	**8**
10	**1.1.5.1,Sources of information**	**2d**	**07/17/2017**	**07/18/2017**	
11	1.1.5.1.1,Primary sources	1d	07/17/2017	07/17/2017	
12	1.1.5.1.2,Secondary sources	1d	07/18/2017	07/18/2017	
13	1.1.5.2,Research methods	2d	07/19/2017	07/20/2017	
14	1.1.5.3,Tools	2d	07/19/2017	07/20/2017	
15	1.1.5.4,Assumptions & constraints	1d	07/21/2017	07/21/2017	
16	1.1.5.5,Deliverables	1d	07/21/2017	07/21/2017	
17	1.1.6,Executive summary	5d	07/24/2017	07/28/2017	
18	**1.1.6,Annexes**	**20d**	**07/03/2017**	**07/28/2017**	
19	1.1.6.1,Bibliography	10d	07/17/2017	07/28/2017	8
20	1.1.6.2,FGP schedule	5d	07/03/2017	07/07/2017	5,6
21	1.2,Graduation Seminar approval.	10d	07/31/2017	08/11/2017	9,19
22	**2,Tutoring process**	**65d**	**08/14/2017**	**11/10/2017**	
23	**2.1,Tutor**	**3d**	**08/14/2017**	**08/16/2017**	
24	2.1.1,Tutor assigment	1d	08/14/2017	08/14/2017	21
25	2.1.2,Communication	2d	08/15/2017	08/16/2017	24
26	2.2,Adjustments of previous chapters (If needed)	5d	08/17/2017	08/23/2017	24,25
27	2.3,Charter IV. Development (Results)	47d	08/24/2017	10/27/2017	26
28	2.4,Chapter V. Conclusions	5d	10/30/2017	11/03/2017	27
29	2.5,Chapter VI. Recommendations	5d	11/06/2017	11/10/2017	28
30	2.6,Final bibliography	1d	11/10/2017	11/10/2017	
31	2.7,Final annexes	1d	11/10/2017	11/10/2017	
32	Tutor approval	0d	11/10/2017	11/10/2017	29
33	**3,Reading by reviewers**	**15d**	**11/13/2017**	**12/01/2017**	
34	**3.1,Reviewers assigment request**	**5d**	**11/13/2017**	**11/17/2017**	
35	3.1.1,Assigment of two reviewers	2d	11/13/2017	11/14/2017	32
36	3.1.2,Communication	2d	11/15/2017	11/16/2017	35
37	3.1.3,FGP submission to reviewers	1d	11/17/2017	11/17/2017	36
38	**3.2,Reviewers work**	**10d**	**11/20/2017**	**12/01/2017**	
39	**3.2.1,Reviewer**	**10d**	**11/20/2017**	**12/01/2017**	
40	3.2.1.1,FGP reading	9d	11/20/2017	11/30/2017	37
41	3.2.1.2,Reader 1 report	1d	12/01/2017	12/01/2017	40
42	**3.2.2,Reviewer**	**10d**	**11/20/2017**	**12/01/2017**	
43	3.2.2.1,FGP reading	9d	11/20/2017	11/30/2017	37
44	3.2.2.2,Reader 2 report	1d	12/01/2017	12/01/2017	43
45	**4,Adjustments**	**10d**	**12/04/2017**	**12/15/2017**	
46	4.1,Report for reviewers	5d	12/04/2017	12/08/2017	44
47	4.2,FGP update	1d	12/11/2017	12/11/2017	46
48	4.3,Second review by reviewers	4d	12/12/2017	12/15/2017	46,47
49	**5,Presentation to Board of Examiners**	**5d**	**01/08/2018**	**01/12/2018**	
50	5.1,Final review by board	3d	01/08/2018	01/10/2018	48
51	5.2,FGP grade report	2d	01/11/2018	01/12/2018	50
52	FGP End	0d	01/12/2018	01/12/2018	51



Appendix 4: Other relevant information

SAINT VINCENT AND THE GRENADINES

Government Gazette

(EXTRAORDINARY)

Published by Authority

[Vol. 150] Saint Vincent and the Grenadines, Tuesday 24th October, 2017 – (No. 56)

GOVERNMENT NOTICES

DEPARTMENTAL AND OTHER NOTICES

PHYSICAL PLANNING AND DEVELOPMENT BOARD TOWN AND COUNTRY PLANNING ACT 1992

PUBLIC NOTICE

Notice is hereby given that an application has been made to the Physical Planning and Development Board by **LYSTRA CULZAC.**

To construct a New Multiple Family residence at Arnos Vale.

A copy of the application and of the plans and other documents submitted with it may be inspected at the offices of the Physical Planning Unit, Ministry of Housing, Informal Human Settlements, Lands and Surveys, Physical Planning, Sharp Street, during the hours of 8:00 a.m. -12 noon and 1:00 p.m.- 4:15 p.m. Monday - Friday for a period of fourteen (14) days following the date of issue of the notice.

Any person wishing to make representation to the Board in connection with this application should do so in writing to the Secretary of the Board and within the above-mentioned period.

TYRONE BALLAH
Secretary
Physical Planning & Development Board.