UNIVERSIDAD PARA LA COOPERACION INTERNACIONAL
(UCI)

PROJECT MANAGEMENT PLAN FOR THE CONSTRUCTION OF A COLD STORAGE FACILITY FOR TM FISHING INC.

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FINAL GRADUATION PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
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(UCI)

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 work to Yahweh from whom my strengthen comes. Through this trying times he has been my one assurance. Praise be his name.

To the few who in whatever way supported me during this journey, may Yahweh continue to bless you.

ACKNOWLEDGMENTS

Firstly, I wish to acknowledge the hand of Yahweh throughout this journey for without him I would not have made it this far.

I would like to acknowledge my friends and family who have along the way been a source of encouragement and support. Your kindness was the hand of Yahweh manifested.

Additionally, I would like to thank my employer who has been patient and supportive affording me particularly during crunch time to operate outside of office to be able to work on this final project. Your kindness and consideration will be paid forward.

Lastly, I wish to acknowledge the faculty of UCI for being accommodating during periods of stress and discouragement

Thank you.

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ABBREVIATIONS AND ACRONYMS

- Must be in alphabetical order.

CSR	Corporate Social Responsibility
DMA	Dominica
FAO	Food & Agriculture Organization
FT	Feet
HSSE:	Health, Safety, Security and Environmental (
ISO	International Organization for Standardization
OECS	Organization of Eastern Caribbean States
PMI	Project Management Institute
PV	Photovoltaic
SD -	Sustainable Development
SQFT	Square Feet
SQP	Sustainable Quality Plan
SWOT	Strength, Weakness, Opportunity, Threats
WBS	Work Breakdown Structure
PCO	Project Change Order

EXECUTIVE SUMMARY (ABSTRACT)

TM Fishing is a subsidiary of MJA Enterprises Inc. established in 2018 in the commonwealth of Dominica. TM Fishing Inc. was conceptualized in part as a response to gap in the fish and seafood supply market during the aftermath of Hurricane Maria that occurred in September 2017. The principle shareholder of the company, Mr. M Anthony functions in the role of C.E.O. Mr. Anthony is a registered fisher having completed the requisite training from the Ministry of Blue & Green Economy, Agriculture and National Food Security in the Commonwealth of Dominica. Fishing is integral to the socio-economic landscape of Dominica with profound cultural, health and income generating reach.

In the past two (2) years, the company has experienced significant growth which required capital asset expansion to include: two (2) fishing boats, a refrigerated truck, a 4x4 hulling/delivery truck and several refrigerators among other essential assets. The business has been experiencing steady growth resultant from securing supplier contracts for several supermarkets and restaurants. This growth has necessitated further expansion which will include a cold storage facility; this need is further compounded by the inability of the local Fisheries Division to provide cold storage due to damage sustained to its facility during the passage of Hurricane.

The issue at hand currently is that the proprietor does not have the necessary capital to undertake the envisaged expansion and is seeking capital injection from both grant funding and traditional finance avenues. Secondly and more importantly, due to inexperience, management is adopting an ad hoc approach to the construction initiative; there is not a formal management plan to guide scope or cost or inform potential financiers of the commitment expected. The absence of this critical tool exposes this novice business to avoidable pitfalls, which will translate into higher cost, substandard facility (having not secured required planning and environment health approvals) and prolonged construction time.

The primary purpose of the exercise was to develop a management plan for TM Fishing; the scope of the project is to facilitate the construction an energy efficient state of the art cold storage facility to house fish and seafood.

The overall objective was to develop a comprehensive project management plan grounded in the ethos of sustainability to ensure efficient use of resources for the construction of cold storage facility that adds value to community development through the expansion of a small business venture. The specific objectives of this venture were to create a project charter that outlines the scope, timeframe and resources required for implementation of the project; to create a scope management plan that outlines all relevant stakeholders inclusive of their individual requirements and expectations, to develop a time management plan that will facilitate the delegation of key tasks / activities that can be monitored and evaluated, to create a dynamic and integrative cost management plan that details all cost related components critical to the implementation of the project, to develop a procurement management plan rooted in sustainability and international industry specific best practices, to formulate a communication management plan that clearly defines the strategies to be employed for both internal and external exchanges, to develop a human resource management plan that will facilitate the engagement of the accurate number of employees required, with matching skill requirements to accomplish organisational goals also ensuring that engagements processes are in tandem with international laws, to establish a change management plan that will support the management of processes thus ensuring synergies among other all key knowledge areas to minimize the impact of change on the vision of the organization, to develop a quality management plan that merges stakeholder acceptance criteria with industry establish quality standards and to formulate a stakeholder management plan that identifies, categorizes and analyses the impact of stakeholders on the vision of the initiative.

The development of this project relied on both primary and secondary sources of information. Primarily case studies were utilized to provide essential industry

specific information to create a comprehensive document. This was supported by collection of information from secondary sources such as academic papers, industry specific publications particularly PMBOK ® Guide and Construction.

Application of the methodologies outlined above provided the foundation for the output of this project to be developed. This was of course not without significant challenges. However, the findings suggest that the integration of sustainability principles into the construction industry particularly in a small island developing states like Dominica is critical for the overall development. Integrating sustainability into the Built/Construction industry holds tremendous value, however, significant skills advancement and revision of integration approaches are paramount to support this revision. S

It is therefore recommended that the Government employs a more dynamic approach to the revision of current building codes and guidelines to take into consideration more modern architectural and building designs. This is critical to mitigate against the implications of negative externalities create from the construction industry. Updated building codes will tie into the development and implementation of Land Use Planning visions. The Physical Planning Division should be more proactive with efforts to educate stakeholders thus ensuring greater buy-in for reform proposals. The construction industry needs to be regulated and monitored. As such It is important that training and certification of construction related personnel be prioritized as conditions for employment. Construction is particularly in Small Developing Islands (Caribbean) is not an area that is researched. It means that there is little to no location based scientific or historical data to inform advancement of the industry. It is critical therefore that all stakeholders (Government, Natural Resource Management Agencies,

INTRODUCTION

BACKGROUND

TM Fishing is a subsidiary of MJA Enterprises Inc. established in 2018 in the commonwealth of Dominica. TM Fishing Inc. was conceptualized in part as a response to gap in the fish and seafood supply market during the aftermath of Hurricane Maria that occurred in September 2017. The principle shareholder of the company, Mr. M Anthony functions in the role of C.E.O. Mr. Anthony is a registered fisher having completed the requisite training from the Ministry of Blue & Green Economy, Agriculture and National Food Security in the Commonwealth of Dominica. Fishing is integral to the socio-economic landscape of Dominica with profound cultural, health and income generating reach.

In the past two (2) years, the company has experienced significant growth that required capital asset expansion to include: two (2) fishing boats, a refrigerated truck, a 4x4 hulling/delivery truck and several refrigerators among other essential assets. The business has been experiencing steady growth resultant from securing supplier contracts for several supermarkets and restaurants. This growth has necessitated further expansion that will include a cold storage facility; compounded by the inability of the local Fisheries Division to provide cold storage due to damage sustained to its facility during the passage of Hurricane.

Based on this and recognition of the inability of competitors to bridge the gap in supplying the market demand, the company has decided to invest in a cold storage facility. To make this venture economically viable as well as in keeping with current trends in sustainability, management has taken the decision to incorporate renewable energy and climate smart technology in the design and construction of the facility.

TM fishing operates from the small Southwestern community of Loubiere. Though not classified as a fishing community, Loubiere has a long history of a small but active number of fisher folk. In the recent past however, these activities have

dwindled due to lack of interest and lack requisite capital investment. The community is positioned to rebuild and expand fishing given that there is now a well-defined bay and a readily available market.

STATEMENT OF THE PROBLEM

TM Fishing though new has had the good fortune of capturing a significant portion of the market in the south-west district. However, as the company grows to meet the demands of the market and further cement its position, expansion of physical space to accommodate storage is critical. The issue at hand currently is that the proprietor does not have the necessary capital to undertake the envisaged expansion and is seeking capital injection from both grant funding and traditional finance avenues.

Secondly and more importantly, due to inexperience, management is adopting an ad hoc approach to the construction initiative; there is not a formal management plan to guide scope or cost or inform potential financiers of the commitment expected. The absence of this critical tool exposes this novice business to avoidable pitfalls, which will translate into higher cost, substandard facility (having not secured required planning and environment health approvals) and prolonged construction time.

PURPOSE

The primary purpose of the exercise is to develop a management plan for TM Fishing; the scope of the project is to facilitate the construction an energy efficient state of the art cold storage facility to house fish and seafood. The facility is critical to business expansion through "cold chain". Cold Chain is a temperature-controlled supply chain. An unbroken cold chain is an uninterrupted series of refrigerated production, storage and distribution activities, along with associated equipment and logistics, which maintain a desired low-temperature range. In addition to storage, the company will sell ice. This facility will also create employment opportunities for the youth within the community. More importantly, the management plan once

adopted will inform future approaches to project management as the company continues to grow.

This venture will solidify its position as a supplier high quality product at competitive prices while satisfying national mandates of environmental sustainability, employment creation and supporting national food security. In the aftermath of a series of natural disasters most recent was 2017 Hurricane Maria, the country has place more significant attention on national food security.

The study will investigate among other things:

1. The impact of a project management plan on business success
2. The relationship between implementation of management plans and business sustainability

1.4 GENERAL OBJECTIVES

To develop a comprehensive project management plan grounded in the ethos of sustainability to ensure efficient use of resources for the construction of cold storage facility that adds value to community development through the expansion of a small business venture.

SPECIFIC OBJECTIVES

1. To create a project charter that outlines the scope, timeframe and resources required for implementation of the project.
2. To create a scope management plan that outlines all relevant stakeholders inclusive of their individual requirements and expectations
3. To develop a time management plan that will facilitate the delegation of key tasks / activities that can be monitored and evaluated
4. To create a dynamic and integrative cost management plan that details all cost related components critical to the implementation of the project
5. To develop a procurement management plan rooted in sustainability and international industry specific best practices

6. To formulate a communication management plan that clearly defines the strategies to be employed for both internal and external exchanges
7. To develop a human resource management plan that will facilitate the engagement of the accurate number of employees required, with matching skill requirements to accomplish organisational goals also ensuring that engagements processes are in tandem with international laws.
8. To establish a dynamic and effective risk management plan that outlines for the team the strategies necessary to respond to internal and external risks thus ensuring a more successful completion of the project
9. To establish a change management plan that will support the management of processes thus ensuring synergies among other all key knowledge areas to minimize the impact of change on the vision of the organization
10. To develop a quality management plan that merges stakeholder acceptance criteria with industry establish quality standards
11. To formulate a stakeholder management plan that identifies, categorizes and analyses the impact of stakeholders on the vision of the initiative.

THEORETICAL FRAMEWORK

2.1 COMPANY/ENTERPRISE FRAMEWORK

COMPANY/ENTERPRISE BACKGROUND

TM Fishing is a small enterprise own by MJA Enterprises Inc and managed by Mervin Anthony. The business is a novice with less than three (3) years of experience in fresh fish and sea food harvesting. The business is operationalized in a small south West community on the island of Dominica. The daily operations of the business are supported by senior management staff in production, administration and sales/marketing.

MISSION AND VISION STATEMENTS

VISON STATEMENT:

TM Fishing strives to be a resource centred business; our Vision is to offer our customers a tasteful, healthy and ethical fish product while contributing to sustainable and socially focused initiatives. Establishing good relationships forms the basis on which we operate, with our staff but also with our customers and partners.

MISSION STATEMENT:

TM Fishing is committed to providing our customers with the highest quality fresh and frozen seafood products available in the marketplace. We must do this efficiently and profitably in order to be a sustainable business enterprise. To achieve this mission, every one of our employees must be part of our Quality Assurance Team and make that our number one priority.

With consistent quality product and efficient operations, TM Fishing will position itself to provide our employees with long term, rewarding careers at the same time building mutually beneficial partnerships with our customers.

TM Fishing is a customer first business, because of them, we are!

ORGANIZATIONAL STRUCTURE

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TM Fishing Inc. is a small enterprise on the premise of its organizational structure, its operational and capital structure. The company at present has one principle shareholder who functions in the role of Chief Executive Officer. The company has three critical functional areas: Production, Administration and Sales

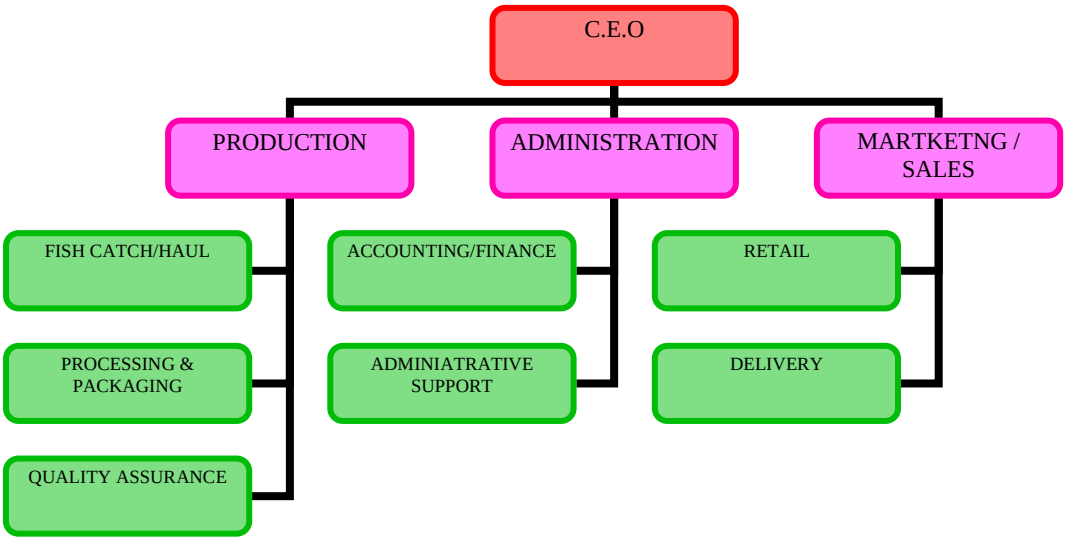

Chart 1: Organizational Structure TM Fishing

PRODUCTS OFFERED

TM Fishing specializes in providing fresh catch of local and exotic salt and fresh fish and seafood to its growing clientele. The company offers complimentary services, which include pre-cleaned fish and delivery. Additionally, with expansion the company seeks to offer for sale, crushed ice used by anglers for daily fishing expeditions.

2.2 PROJECT MANAGEMENT CONCEPTS

Must indicate the main project management concepts, such as project, project management, project life cycle, knowledge areas, project management processes, process groups, and any other applicable project management related concepts.

Must include the relationship of these concepts with the topics to be developed for the FGP, as well as with the company/enterprise context. For example: if the company has its own project life cycle, it should be presented on this section, after the generic project life cycle definition.

Remember to use APA style cites as needed for every bibliographical source used.

PROJECT

The project Management Institute (PMBOK® Guide) defines projects as **temporary;** an activity categorized by a fixed commencement and end date that consequently defines or determines the scope or reach and the resources utilized. Further too, projects are described as unique on the premise that it is not a routine operation, but a specific set of activities designed to accomplish a singular goal. According to the PMBOK ® Guide, projects are a critical catalyst for change, their existence stems from the need to springboard/ effect a change that, under normal operational circumstances would not be possible. Critical to the development, implementation and success of any project is a clearly defined objective. According to Mochal (n.d), objectives give specificity to the overarching goals of the project, it formulates in a series of actionable statements of how resources etc. will be utilized to reached the proposed outcomes.

PROJECT MANAGEMENT

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Project management is accomplished through the appropriate application and integration of the project management processes identified for the project. Project management enables organizations to execute projects effectively and efficiently (PMI, 2017, p10). This

definition is explicit in that there is an understood requirement for parts/elements to work in synergy to bring forth the anticipated outcome.

In communicating the value of project management Adrian Mcknight, quoted in (PMI,2010) articulates that, “The delivery of business outcomes is realized through the success of projects, and in essence that is the way that project management strategies drive organizational success,” (pg. 3). As such it is appreciated that implementing project management processes across the organization helps create a strategic value chain that gives companies an edge on their competitors, particularly in high-risk sectors and markets. Being able to deliver projects on time and within budget often determines whether a company will get the next job or whether its new product hits the market. This is particularly relevant to construction management.

As postulated by PMBOK® Guide, the processes of project management are critical for creating a foundation that will if management correctly result in a series of successes. The distinct but interrelated process include; initiating, planning, implementing/executing, monitoring & controlling and closing. Of course, given the nature of the specific project being pursued there may be slight deviations to accommodate for industry standards etc.

PROJECT LIFE CYCLE

The PMBOK® Guide succinctly defines project life cycle as project life cycle as “the series of phases that a project passes through from its initiation to its closure” (PMI, 2017; pg 19). The life cycle pertains to the different stages that are to be followed in a sequential manner to effect the anticipated change. Project life cycles fall into three classifications: predictive (waterfall), to iterative/incremental, and adaptive (agile).

Given the nature for the project pursued by TM Fishing, the best suited project life cycle for construction is predictive/waterfall. According to PMBOK® Guide,

predictive–project scope, time and cost are determined in the early phases of the life cycle (PMI, 2017)

The Management consultant engaged by TM Fishing is cognizant of the interaction among all the processes of project management at key phases in the project life cycle and has made it a point to education senior management and staff so as to ensure total buy-in and support for the project.

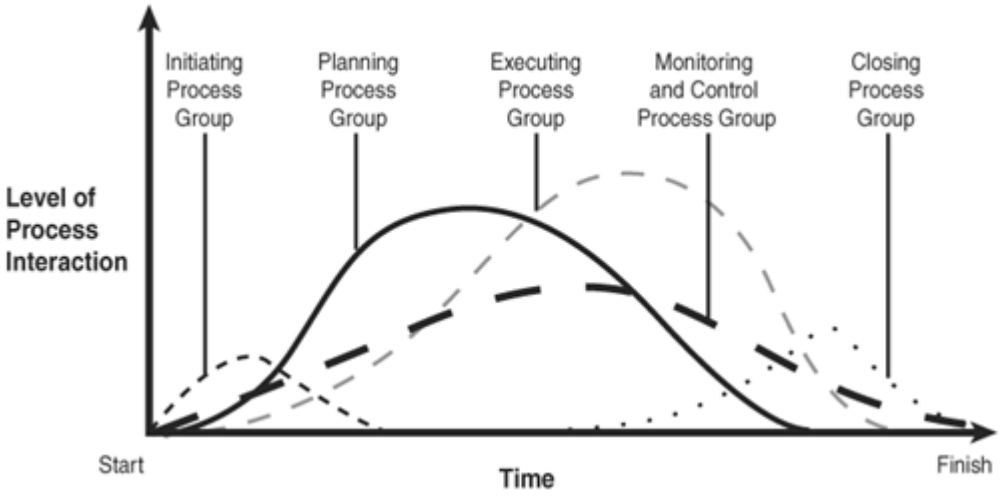

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Figure 1: Interaction of Processes at different stages (Source: PMBok, 2013)

Figure 1 above provides visual context for the interaction of time and the different stages of the project life cycle. Further too, the diagram demonstrates the amount of effort/activity required at the commencement of the initiative, as the project matures significantly for effort/activity is needed to satisfy the overall objective of the project. The image further communicates the degree of overlap between the different stages; this must inform management of the importance of broad-based efficiency in implementation.

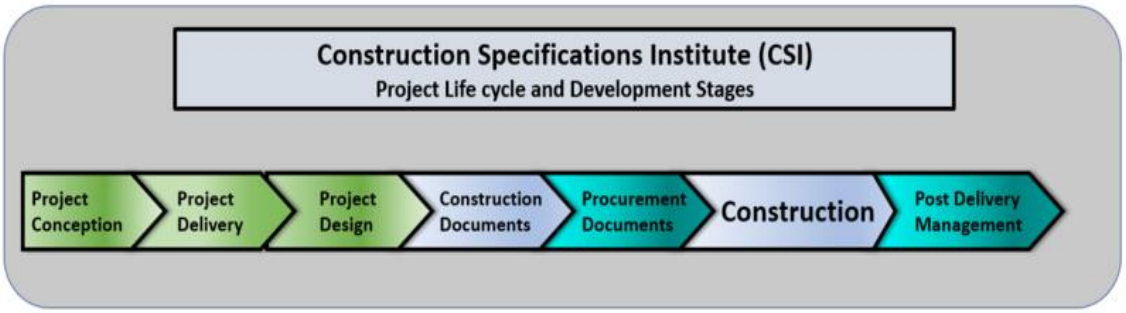

Figure 2: Construction Life Cycle (Source- Construction Specification Institute (CSI)

Figure 2 provides a visual representation of the management processes for construction. While there are slight variations in terminology, the principles of implementation are grounded in traditional project management.

PROJECT MANAGEMENT PROCESSES

Project management is defined by five distinct but interrelated processes denoted in the definition of the project life cycle above. Processes are discussed below:

a) Initiating: the process is characterized as the project conceptualization and feasibility study phase. Some activities performed during this process include defining the project goal; defining the project scope; identifying the project manager and the key stakeholders; identifying potential risks; and producing an estimated budget and timeline.

b) Planning: the activities undertaken in this stage allows for the development of a generalized guide by the project manager that will guide the activities undertaken. This blueprint will map out the project's scope; resources required to create the deliverables; estimated time and financial commitments; communication strategy to ensure stakeholders are kept up to date and involved; execution plan; and proposal for ongoing maintenance.

c) Executing: This phase is characterized by the procurement of the necessary resources; physical and human necessary for the implementation of the project.

The PM is expected during this phase to employ a series of interrelated tools and techniques to ensure that assigned responsibilities etc. are met. This will include delegating and overseeing work

d) Monitoring and control: project managers will closely measure the progress of the project to ensure it is developing properly. Documentation such as data collection and verbal and written status reports may be used. “Monitoring and controlling is closely related to project planning. While planning determines what is to be done, monitoring and controlling establish how well it has been done,” explains SME Toolkit. “Monitoring will detect any necessary corrective action or change in the project to keep the project on track.”

e) Closing: A project can only close when the key deliverables have been satisfactorily met. The process requires validation and approval of deliverables as being satisfactorily completed by key stakeholders. The project manager will close contracts with suppliers, external vendors, consultants, and other third-party providers. All documentation will be archived and a final project report will be produced.

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

Figure 3: Project Management Process Group & Knowledge Area Mapping (Source: PMBok 2013)

PROJECT MANAGEMENT KNOWLEDGE AREAS

According to the PMBOK ® Guide, a Knowledge Area is an identified area of project management defined by its knowledge requirements and described in terms of its component processes, practices, inputs, outputs, tools, and techniques. (PMI 2017, pg. 23). There are ten (10) knowledge areas, which includes: Project Integration management, Project Scope Management, cost management, quality management, resource management, communication, risk, procurement and stakeholder management.

PROJECT INTEGRATION MANAGEMENT

Project Integration Management includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups. In the project management context, integration includes characteristics of unification, consolidation, communication, and interrelationship. These actions are applied from the start of the project through completion. Project Integration Management includes making choices about:

- Resource allocation,
- Balancing competing demands,
- Examining any alternative approaches,
- Tailoring the processes to meet the project objectives, and
- Managing the interdependencies among the Project Management Knowledge Areas.

PROJECT SCOPE MANAGEMENT

Monnappa (2020) defines scope project as the clear identification of the work that is required to complete or deliver. Project manager is tasked with the responsibilities is to ensure that only the needed work (the scope) will be performed and that each of the deliverables can be completed in the allotted time and within budget.

PROJECT SCHEDULE MANAGEMENT

Schedule management is the process of developing, maintaining and communicating schedules for time and resource. Schedule management is the process of developing, maintaining and communicating schedules for time and resource.

PROJECT COST MANAGEMENT

Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so that the project can be completed within the approved budget. The processes integral to this knowledge area are as follows

- Plan Cost Management—The process of defining how the project costs will be estimated, budgeted, managed, monitored, and controlled.
- Estimate Costs—The process of developing an approximation of the monetary resources needed to complete project work.
- Determine Budget—The process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline.
- Control Costs—The process of monitoring the status of the project to update the project costs and manage changes to the cost baseline.

PROJECT QUALITY MANAGEMENT

Ray (2018) articulates that Project quality management encompasses the processes and activities that are used to figure out and achieve the quality of the deliverables of a project. However, quality can be an elusive word. In the simplest terms, quality is defined as what the customer or stakeholder needs from the project deliverables.

PROJECT RESOURCE MANAGEMENT

This knowledge area according to PMBOK ® Guide includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project. These processes help ensure that the right resources will be available to the project manager and project team at the right time and place. This knowledge area is broken down into six important processes:

- Plan Resource Management—The process of defining how to estimate, acquire, manage, and utilize physical and team resources.
- Estimate Activity Resources—The process of estimating team resources and the type and quantities of material, equipment, and supplies necessary to perform project work.
- Acquire Resources—The process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work.
- Develop Team—The process of improving competencies, team member interaction, and the overall team environment to enhance project performance.
- Manage Team—The process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance.
- Control Resources—The process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual use of resources, and performing corrective action as necessary

PROJECT COMMUNICATIONS MANAGEMENT

The Processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval and ultimate disposition of project information. This knowledge area is made up of five processes to determine what to communicate,

to whom, how often, and when to re-evaluate the plan. An effective project manager spends about 90% of his time communicating and 50% of that time is spent communicating with the project team

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PROJECT RISK MANAGEMENT

According to Lavanya, N. & Malarvizhi, T. (2008). risk Analysis and Management is a key project management practice to ensure that the least number of surprises occur while your project is underway. While we can never predict the future with certainty, we can apply a simple and streamlined risk management process to predict the uncertainties in the projects and minimize the occurrence or impact of these uncertainties. This improves the chance of successful project completion and reduces the consequences of those risks

PROJECT PROCUREMENT MANAGEMENT

The process by which personnel/goods/services are acquired is called procurement. Procurement management is critical to project success as it allows project management to develop protocols etc. that are in line with best practices as particularly where sources for services or products are outside of the company.

PROJECT STAKEHOLDER MANAGEMENT

Project Stakeholder Management is the knowledge area that allows the project manager and team to through assessment determine not only who the stakeholders are but, what their interest and influence on the project are as well as the expectations of stakeholders as individuals and as social/ economic strata. The understanding of stakeholders is critical to the success of the project implementation.

The above denotes the traditionally accepted knowledge areas that govern project management activities. However, as mentioned early depending on the nature of

the project slight variation, such is the case for construction management. According to Construction Extension PMBOK ® Guide there are two specific knowledge areas that are to be adopted: Project Health, Safety, Security and Environmental (HSSE) Management and Project Financial Management.
According to the text, HSSE management is necessary given the unique nature of construction projects, health and security considerations are generally included as part of safety and environmental management, all of which are incorporated under the umbrella of HSSE.

Whereas, Project Financial Management determines how the project will be financed, including the processes to acquire and manage the financial resources for the project. It is more concerned with revenue sources and monitoring net cash flows for the construction project than with managing day-to-day costs.

Particularly for a small company undertaking expansion it is imperative that outside of the management consultant it is imperative that all senior level management avail themselves to understand, adopt and support the use of these knowledge areas.

2.3 OTHER APPLICABLE THEORY/CONCEPTS RELATED TO THE PROJECT TOPIC AND CONTEXT

SUSTAINABILITY AND CONSTRUCTION MANAGEMENT

According to (Callinan (2019), sustainable construction management means far more than building environmentally friendly structures. The author further explains that It is the combination of sustainable construction practices and sustainable building materials in order to reduce waste and environmental impact.

It is appreciated that construction is a high waste capacity generator with waste material that includes wood, concrete, asphalt, chemically treated materials as well as material that have become contaminated with construction and demolition

materials — concrete, wood, asphalt — piling up quicker than they can be cleared, there is mounting pressure on the construction industry to recycle and repurpose waste

According to Persson, et al (2008), “the management of a construction project in a sustainable way should focus on the entire process from an early design stage towards the final product, and on the benefits and negative impacts that are to be expected during the life of the facility” (pg. 2).

Additionally, the authors postulate that, to manage such a process, in a sustainable way, a management system or tool would need to be development and implemented to monitor and evaluate the phases and processes. To ensure success therefore, synergies between construction and environmental aspects would need to be established and formalized as the standard. For example, the international standard of the environmental management system ISO 14001 and the international quality management system ISO 9001.

While there is currently no established national standard for construction as it relates to environment sustainability the necessary government agencies are being guided by international and regional standards that the construction section is encouraged to adhere to.

RENEWABLE ENERGY AND SUSTAINABLE CONSTRUCTION

Renewable Energy denotes energy used from sources that are continually replenished by nature—the sun, the wind, water, the Earth’s heat, and plants. Renewable energy technologies turn these fuels into usable forms of energy—most often electricity, but also heat, chemicals, or mechanical power (Energy Efficiency & Renewable Energy, 2001, pg1)

Renewable energy has become critical to sustainable construction. Outside of the cost saving benefits, utilization of alternative energy sources reduces consumption of fossil fuel and the financial and environmental implications thereof.

Management of TM Fishing recognizing the benefits of using renewable energy and thus will make significant investment in PV technology to provide electricity for all of the operational matters related to the cold storage facility.

REGENERATIVE DESIGN AND DEVELOPMENT

For the proponents of regenerative development, the concept is most aptly aligned with “renewal and or rebirth”, the idea of returning the environment/space to its original state prior to the disruptions of human activity.

Though new particularly to novice entrepreneurs and in developing economies, the concept of regenerative design and development holds much significance as it is now influencing building codes/standards, materials, methods etc. However, according to Cole, 2002, the concept in actuality speaks more to adoption of approaches etc. that encourage co-evolution of people and natural systems. He explains, it is in fact the act of building that becomes a driving force for regeneration.

Though taken from a slightly different perspective to sustainability, the underlying idea that there must be greater emphasis placed on the process of construction from land clearing, to materials used (how they are assessed and determined as suitable), the impact duration of construction will have on the ecosystem etc.

These principles or ideas are particularly useful for TM Fishing given that the national focus in the aftermath of Hurricane Maria is to reduce negative impact on natural resources by the adoption of practices that will support restoration.

CORPORATE SOCIAL RESPONSIBILITY

In a website post by Corporate social responsibility in construction. (n.d.), .the concept of corporate social responsibility (CSR) is defined as the belief that companies should have a positive impact on the community and

wider society rather than simply generating profit. It is further noted that , the overall impact of a company is determined by what it produces, the environmental impact, its recruitment and training processes, its adherence to rights and values, its investment in the community, and so on

Corporate social responsibility as a management concept is growing more and more important also for project companies. Schieg, (2009) postulates that the task of project management is to identify relevant ecological systems, to recognize the internal and external dimension of social responsibility, and to test existing standards of Corporate Social Responsibility for their applicability in projects. The special benefit of CSR in projects is to set-up values such as integrity, credibility and reputation. Successful implementation of CSR activities requires an alignment of commitment of the project organization to the own business operations and own goals.

Corporate social responsivity has become critical to best practices employed by businesses irrespective of size or nature. The prior promoted perspective of the bottom line being king has evolved based on the understanding of the impact of extraction, production and consumption has on the entire system.

Recognizing the importance of this TM Fishing has been encouraged to adopt the CSR model not just a marker of best practice but to change the climate of the fishing industry impacting both supplier and consumer; encouraging others through the power of the dollar to adapt and adopt.

METHODOLOGICAL FRAMEWORK

INFORMATION SOURCES

Information is a valuable commodity in very industry and project management is no exception. Information sources refer to the media via which relevant information can be accessed to further the activity being undertaken. These sources can range from print, electronic or verbal. As well they can be categorized as primary or secondary sources.

3.1.1 PRIMARY SOURCES

A primary source provides direct or first-hand evidence about an event, object, person, or work of art. Primary sources include historical and legal documents, eyewitness accounts, results of experiments, statistical data, pieces of creative writing, audio and video recordings, speeches, and art objects.
Interviews, surveys, fieldwork, and Internet communications via email, blogs, and newsgroups are also primary sources.

To give value to this exercise interviews and consolations will be used as the principle primary sources of information.

3.1.2 SECONDARY SOURCES

Glaser (1963) describe secondary data is data that already exists. It is accepted that this data collected would have been done so for purposes other than what it is being used for by the researcher. Such data is compiled from a multiple source, as per Bhasin (2019) secondary sources are such that pre-exist and are owned by the producer who may or may not make the information available. Secondary sources include Research institutes, Academics, Government and Non-Government publications, newspapers, the internet, International publications etc.

For the purpose of this project both primary and secondary sources will be pursued to give authenticity to the final product. Data will be sourced from Government

Institutions (publications, statutes etc.), academia (research journals), the internet, PMI and other project management publications among others. Additionally, interviews and consultations will be done with primarily management and key stakeholders.

Table 1: Information Sources (Compiled by Author)

Objectives	Information sources	
	Primary	Secondary
To create a project charter that outlines the scope, timeframe and resources required for implementation of the project.	Interviews	a) Dominica Bureau of Standards policy document b) Environment Health standards policy and guide c) Fisheries Division Training Course Manual d) FAO ® Private Standards & Certification in fisheries and aquaculture e) Construction Extension PMBOK® Guide f) PMBOK ® Guide 6th Edition
To create a scope management plan that outlines all relevant stakeholders inclusive of their individual requirements and expectations	Interviews	a) Dominica Bureau of Standards policy document b) Environment Health standards policy and guide c) Fisheries Division Training Course Manual d) FAO ® Private Standards & Certification in fisheries and aquaculture e) Construction Extension PMBOK® Guide f) PMBOK ® Guide 6th Edition
To develop a time management plan that will facilitate the delegation of key tasks / activities that can be monitored and evaluated	Interviews, Consultations	a) Construction Extension, b) PMBOK ® Guide 6th Edition c) Dominica Bureau of Standards policy document d) Environment Health standards policy and guide e) Commonwealth of Dominica Building Code f) The GPM P5 Standard for Sustainability in Project Management v2.0
To create a dynamic and integrative cost management plan that details all cost related components critical to the implementation of the project		a) Construction Extension PMBOK® Guide b) PMBOK ® Guide 6th Edition c) Dominica Bureau of Standards policy document d) Environment Health standards policy and guide e) Commonwealth of Dominica Building Code f) The GPM P5 Standard for Sustainability in Project Management v2.0

Objectives	Information Sources	
	Primary	Secondary
To develop a procurement management plan rooted in sustainability and international industry specific best practices	Consultations	a) Dominica Bureau of Standards policy document b) Environment Health standards policy and guide c) Commonwealth of Dominica Building Code d) The GPM P5 Standard for Sustainability in Project Management v2.0
To formulate a communication management plan that clearly defines the strategies to be employed for both internal and external exchanges	Interviews Consultations Electronic Media	a) PMBOK ® Guide 6th Edition
To develop a human resource management plan that will facilitate the engagement of the accurate number of employees required, with matching skill requirements to accomplish organisational goals also ensuring that engagements processes are in tandem with international laws.	Interviews / consultations	a) PMBOK ® Guide 6th Edition b) Dominica Bureau of Standards policy document
To establish a change management plan that will support the management of processes thus ensuring synergies among other all key knowledge areas to minimize the impact of change on the vision of the organization		a) PMBOK ® Guide 6th Edition b) Dominica Bureau of Standards policy document
To develop a quality management plan that merges stakeholder acceptance criteria with industry establish quality standards	interviews	a) Dominica Bureau of Standards policy document b) Environment Health standards policy and guide c) Fisheries Division Training Course Manual d) FAO ® Private Standards & Certification in fisheries and aquaculture e) Construction Extension PMBOK® Guide f) Vendor Database
To formulate a stakeholder management plan that identifies, categorizes and analyses the impact of stakeholders on the vision of the initiative.	Interviews Consultations	a) PMBOK ® Guide 6th Edition

3.2 RESEARCH METHODS

Research method is a broad term that encompasses the strategies, processes or techniques that will used in the collection of data or evidence for analysis in order to uncover new information or bring clarity to a school of thought. The types of research methodologies that can be employed in the investigation of a subject matter are limitless; the right one or combination of methodologies will be shaped by the matter under investigation and in some cases shaped by previously conducted research.

According to Kothari (2004), research methods are those methods/techniques that are used for conduction of research. More specifically, they refer to the methods the researchers employ in executing research operations. Further, too the author categorizes research methods into three (3) groups:

1. In the first group we include those methods which are concerned with the collection of data. These methods will be used where the data already available are not sufficient to arrive at the required solution;
2. The second group consists of those statistical techniques which are used for establishing relationships between the data and the unknowns;
3. The third group consists of those methods that are used to evaluate the accuracy of the results obtained. (Kothari, 2004; p8)

For the purpose of this assignment, the following research methods were used:

1) Case study – as an analytical method;

2) Interviews

Case studies are defined as methods that aim to analyze specific issues within the boundaries of a specific environment, situation or organization. It is used to generate hypothesis and validate a method. (Teegavarapu, et al. 2008). Teegavarapu, et al. (2008) further postulate that, as an establish research method the popularity of case studies lies in its flexibility, applicability and ease of use. These methods are categorized into three groups based on design: explanatory, descriptive or exploratory.

Another equally popular and complimentary research method is interviews. Qualitative research is defined as a method that affords the researcher to collect data directly from subjects through a question and answer process. The researcher has the option to use structured or unstructured formats; this decision will be informed by the nature of the study being pursed. Interviews as a credible method has been critiqued throughout academia; according to Hosifi et al (2014) their flexibility may imply that they are not reliable and they also need highly skilled interviewers this they argue is compounded by the fact that the exercise can be time sensitive and consuming and require significant financial resources. Another point of argument is that of subjectivity, respondents depending on the circumstances are more likely to give response in line with the interviewer's expectations thus raising questions about validity and appropriateness.

For this exercise, interviews/ consultations are necessary, as critical information to formulate an effective management plan will be sourced from management, employees and stakeholders.

Table 2: Research Methods (Compiled by Author)

Objectives	Methods
To create a project charter that outlines the scope, timeframe and resources required for implementation of the project.	Interview and document review
To create a scope management plan that outlines all relevant stakeholders inclusive of their individual requirements and expectations	Interview
To develop a time management plan that will facilitate the delegation of key tasks / activities that can be monitored and evaluated	Document review to include design plans, building codes etc. as well as interviews with experts and other stakeholders
To create a dynamic and integrative cost management plan that details all cost related components critical to the implementation of the project	The budget will be developed from information sourced from interviews/consultations with stakeholders (vendors and management)
To develop a procurement management plan rooted in sustainability and international industry specific best practices	Review of other similar cases procurement management plans as well as interviews with stakeholders more specifically vendors

Objectives	Methods
To formulate a communication management plan that clearly defines the strategies to be employed for both internal and external exchanges	Review of case studies re: communication plans and construction(sustainable) Interview/ consultation with experts and other stakeholders (service providers)
To develop a human resource management plan that will facilitate the engagement of the accurate number of employees required, with matching skill requirements to accomplish organisational goals also ensuring that engagements processes are in tandem with international laws.	Review of case studies with similar context Interviews/ consultations with critical stakeholders (labour division)
To establish a change management plan that will support the management of processes thus ensuring synergies among other all key knowledge areas to minimize the impact of change on the vision of the organization	This will be developed after review of existing documentation relevant to sustainable construction for fisheries industry
To develop a quality management plan that merges stakeholder acceptance criteria with industry establish quality standards	Review/analysis of construction and fisheries quality documents Interviews/consultations with experts and other critical stakeholders
To formulate a stakeholder management plan that identifies, categorizes and analyses the impact of stakeholders on the vision of the initiative.	Review of case studies to inform development of stakeholder plan Interviews/consultations with key stakeholders

3.3 TOOLS

Tools are instruments developed and used to collect information pertinent to the study undertaken According to Pandy & Pandy (2015) different tools used for data collection may be;

1. Questionnaires
2. Interviews
3. Schedules
4. Observation Techniques
5. Rating Scales (p.58)

This, however, are just a few of the tools that can be employed to collect data.

For the purpose of this FGP a number of the above listed to included questionnaires and interviews will be utilized in conjunction with PMBOK ® Guide recommendations to include WBS, Surveys, Expert judgement, Lesson learned documentation etc.

Table 3: Research Tools (Complied by Author)

Objectives	Tools
To create a project charter that outlines the scope, timeframe and resources required for implementation of the project.	• Expert judgment • Alternatives analysis • Meetings
To create a scope management plan that outlines all relevant stakeholders inclusive of their individual requirements and expectations	• Expert judgment • Data analysis • Alternatives analysis • Meetings
To develop a time management plan that will facilitate the delegation of key tasks / activities that can be monitored and evaluated	• Expert Judgements • Meetings • Schedules
To create a dynamic and integrative cost management plan that details all cost related components critical to the implementation of the project	• Bottom-up estimating • Three-point estimating • Reserve analysis • Vendor bid analysis
To develop a procurement management plan rooted in sustainability and international industry specific best practices	• Expert judgment • Market research • Make-or-buy analysis • Source selection analysis • Meetings • Vendor bid analysis
To formulate a communication management plan that clearly defines the strategies to be employed for both internal and external exchanges	• Expert judgment • Communication requirements • analysis • Communication technology • Communication models • Communication methods • Meetings
To develop a human resource management plan that will facilitate the engagement of the accurate number of employees required, with matching skill requirements to accomplish organisational goals also ensuring that engagements processes are in tandem with international laws.	

To establish a change management plan that will support the management of processes thus ensuring synergies among other all key knowledge areas to minimize the impact of change on the vision of the organization	• Lewin's **Change** Model. • Gantt Charts. • Kotter's 8 Step **Change** Model. • Expert Judgement
To develop a quality management plan that merges stakeholder acceptance criteria with industry establish quality standards	• Expert judgment • Claims administration • Performance reviews • Earned value analysis • Trend analysis • Inspection • Audits
To formulate a stakeholder management plan that identifies, categorizes and analyses the impact of stakeholders on the vision of the initiative.	• Expert judgment • Questionnaires and surveys • Stakeholder analysis • Stakeholder maps representation • Meetings

3.4 ASSUMPTIONS AND CONSTRAINTS

According to PMI PMBOK ® Guide, assumptions are factors that, for planning purposes, are considered to be true, real, or certain without proof or demonstration. Constraints however, are defined as limitations placed upon the project that the project manager and team must work within.

The *PMBOK® Guide* identifies six project constraints: scope, quality, schedule, budget, resource and risk. Within the context of this FGP schedule and risks are the constraints identified as paramount. The exercise however, is being executed under the assumption that the end product will be of a high quality and that requisite resources will be made available to allow for delivery/realization of objectives.

Table 4: Assumptions and Constraints (Compiled by Author)

Objectives	Assumptions	Constraints
To create a project charter that outlines the scope, timeframe and resources required for implementation of the project.	Indicate assumptions applicable for this objective.	Indicate constraints applicable for this objective.
To create a scope management plan that outlines all relevant stakeholders inclusive of their individual requirements and expectations	The project scope will be accurately defined	Changes to scope definition as project progresses as a result of other elements to include finance
To develop a time management plan that will facilitate the delegation of key tasks / activities that can be monitored and evaluated	A realistic time management plan will be development	Lack of sufficient reliable expert judgement to provide necessary support and guidance to develop plan
To create a dynamic and integrative cost management plan that details all cost related components critical to the implementation of the project	A comprehensive budget forecast developed	Price changes of vendors
To develop a procurement management plan rooted in sustainability and international industry specific best practices	A sustainable procurement plan reflecting all established industry standards develop	
To formulate a communication management plan that clearly defines the strategies to be employed for both internal and external exchanges	An inclusive and stakeholder appropriate communication plan will be developed	External elements may impact effectiveness of plan
To develop a human resource management plan that will facilitate the engagement of the accurate number of employees required, with matching skill requirements to accomplish organisational goals also ensuring that engagements processes are in tandem with international laws.	All roles and responsibilities will be clearly defined in the HRM Plan. The right persons will be matched to the right tasks	Not all resources may be available due to outside influences to support the implementation of the plan
To establish a change management plan that will support the management of processes thus ensuring synergies among other all key knowledge areas to minimize the impact of change on the vision of the organization	A dynamic and effective change management plan will be developed suitable to the context at hand	Changes in project scope
To develop a quality management plan that merges stakeholder acceptance criteria with industry establish quality standards	A quality management plan that is reflective of both local and international standards will be developed	Changes in quality standards during implementation

Objectives	Assumptions	Constraints
To formulate a stakeholder management plan that identifies, categorizes and analyses the impact of stakeholders on the vision of the initiative.	All stakeholders and requirements will be identified.	Level of interest of stakeholders may change

3.5 DELIVERABLES

Simplilearn (2020) defines project deliverable is any product, service, or result that must be completed to finish a project. Deliverables are understood to be either internal or external; Internal deliverables are those necessary for operationalizing the project but produce no end user product, whereas, external deliverables are those tangible or intangible products to be used by the client/benefactor. The deliverables for this exercise will would refer to reports, analysis, change registers, lesson learned logs and management plans.

Table 5: Deliverables (Compiled by Author)

Objectives	Deliverables
To create a project charter that outlines the scope, timeframe and resources required for implementation of the project.	A comprehensive project charter document
To create a scope management plan that outlines all relevant stakeholders inclusive of their individual requirements and expectations	Sustainable scope management plan
To develop a time management plan that will facilitate the delegation of key tasks / activities that can be monitored and evaluated	A sustainable and dynamic time management plan
To create an dynamic and integrative cost management plan that details all cost related components critical to the implementation of the project	Project Budget and cost management plan
To develop a procurement management plan rooted in sustainability and international industry specific best practices	A comprehensive procurement management plan
To formulate a communication management plan that clearly defines the strategies to be employed for both internal and external exchanges	An integrative and sustainable communication management plan
To develop a human resource management plan that will facilitate the engagement of the accurate number of employees required, with matching skill requirements to accomplish organisational goals also ensuring that engagements processes are in tandem with international laws.	A human resource management plan

Objectives	Deliverables
To establish a change management plan that will support the management of processes thus ensuring synergies among other all key knowledge areas to minimize the impact of change on the vision of the organization	A change management plan
To develop a quality management plan that merges stakeholder acceptance criteria with industry establish quality standards	A dynamic and sustainable quality management plan
To formulate a stakeholder management plan that identifies, categorizes and analyses the impact of stakeholders on the vision of the initiative.	A comprehensive Stakeholder Management Plan

RESULTS

4.1 INTEGRATING SUSTAINABILITY IN CONSTRUCTION

Redefining construction management for efficiency and effectiveness is the new aspiration for project management for the industry. Effectiveness and efficiency in today's construction culture speaks to the integration of internationally accepted standards and models that promote the holistic view of sustainability.

History has evidenced that the Construction industry at varied stages was one of the premier perpetrators of activities that produced significant amounts of negative externalities such as waste generation and improper disposal, to human rights violations inclusive of gender discrimination and inadequate compensation to health and safety violation (Ekanayake & Ofori, 2000) (Musenga & Aigbavboa,2018).

Sustainability is defined as an idea of ensuring a better quality of life for every person, now and for future generations by means of achieving social, economic and environmental objective at the same time (World Commission on Environment & Development. 1987). It is on this premise that the current shift in awareness has evolved to one of a higher consciousness appreciating the impact of construction practices on the present and future. To be effective sustainability principles must be integrated throughout the lifecycle of the project from design to execution.

Sustainable or Green Building is one of the current models/frameworks developed to support the integration of sustainable practices into construction. Sustainable building is the design and construction of buildings using methods and materials that are resource efficient and that will not compromise the associated health and well-being of the building's occupants, construction workers, and future generations (Atombo, Dzantor, & Agbo, 2015).

We appreciate that given our context (location and accessibility to resources) there are several limitations to integrating sustainability into the construction phase of this project, however where possible the project management team will employ steps to bring this building into compliance.

4.2 SCOPE MANAGEMENT PLAN

INTRODUCTION

The Scope Management Plan provides the scope framework for this project. This plan documents the scope management approach; roles and responsibilities as they relate to the overall project scope; scope definition; verification and control measures; scope change control; and the project's work breakdown structure.
This project is for the construction of a small green energy Cold Storage Facility in the community of Loubiere. This facility is critical to the business growth goals of the young company. This facility allows the company to solidify its position in the local fishing industry. Given its nature, the project will be will financed from personal investments and bank loans. Additionally, sub-contracted crews and contractors will be engaged to implement the construction plan.

SCOPE MANAGEMENT APPROACH

In this instance, the Project Manager with support from the project team will have full responsibility for scope management. Given the dynamism of construction, changes to the scope are inevitable and as such, a level of planned flexibility is necessary to evaluate, action and manage proposed changes to the scope.

The Scope Statement, Work Breakdown Structure (WBS) and WBS Dictionary will define the project's scope. As principal stakeholders, the Project Manager, Sponsor and Stakeholders will develop and implement tools for documenting and measuring the satisfaction of the project scope. These will include among other things quality checklists and work performance measurements control sheets.

The Owner, Project Manager, Stakeholders or any member of the project team may initiate changes. On this note, synergies among strategies for change management processes, risk management and scope management are critical. Firstly, Change Requests are submitted to the Project Manager who will then evaluate the requested scope change. If the Project Manager accepts/approves,

the request is then forwarded to the Project Team, Project Sponsor and any other party deemed relevant for acceptance.

Where approval of scope changes by Project Sponsor and any other relevant party, all project documents will be updated by the Project Manager and subsequently, communicate the scope change to all stakeholders. In particular, priority consideration will be given to three classifications of changes: Specification, Design and Construction. Given that these have a greater impact on quality, cost and time considerations. It must be noted that outside of the project sponsor etc., external requirements by Government or Industry agencies has a high influence on changes to the project scope. The Project Sponsor has the final decision on acceptance of proposed changes to the project scope.

ROLES AND RESPONSIBILITIES

Management of the project scope is the responsibility of the Project Manager, the sponsor and any other assigned the responsibility. On this premise then, it is imperative that all involved have a clear understanding of their respective roles and responsibilities to ensure that work done is within the established project scope throughout the entire duration of the project. The table below provide an overview of the roles and responsibilities for the scope management of this project.

Table 6:Scope Management Roles & Responsibilities (Compiled by Author)

Name	Role	Responsibilities
TM Fishing Inc.	Sponsor	- Approve or deny scope change requests as appropriate - Evaluate need for scope change requests - Accept project deliverables
Alison E Alfred	Project Manager	- Measure and verify project scope - Facilitate scope change requests - Facilitate impact assessments of scope change requests - Organize and facilitate scheduled change control meetings - Communicate outcomes of scope change requests - Update project documents upon approval of all scope changes
Ephraim Joseph	Main Contractor	- Measure and verify project scope - Validate scope change requests - Participate in impact assessments of scope change requests - Communicate outcomes of scope change requests to team - Facilitate team level change review process
Glenda Joseph	Accountant	- Participate in defining change resolutions - Evaluate the need for scope changes and communicate them to the project manager as necessary
Claude Lauture	Architect	- Participate in defining change resolutions - Evaluate the need for scope changes and communicate them to the project manager as necessary

SCOPE DEFINITION

Scope in project management is defined as the process of obtaining information required to commence a particular project. It is a detailed description of the work needed to bring the project to fruition. The information below represents the scope as defined by the client during our initial interaction. It must be mentioned that post a recent category 5 hurricane significant changes have been made to building codes on the island and several processes have been lengthened and so greater effort has been required to ensure compliance. The initial scope is as follows

Proposed location for building:

The proprietor owns a plot of land approximately 6000sqft/ 0.14 acres in the community of Loubiere

Description of the project

Size: the dimension of the building (20ftx30ft)

Facilities: The building has three (3) key areas: cold storage, cutting and packing and administrative block

Proposed date and duration of construction stages

Start date: 11th June 2020

Duration of construction: June 2020 – September 2020

The construction plan was approved by the Physical Planning Dept. of the Ministry of Planning of the Government of Dominica

Externally, the project will be supervised by representatives of the local Government, Environmental Health Department and the Physical Planning Division.

The building specifications and cost estimates were provided by CB Designs as the Architect, Natasha Jones as Structural Engineer and Kevin Seaman – Geomatic Technologies as Quantity Surveyor. The contractor is Ephraim Joseph- EJ Contractors Inc. who has direct responsibility for eight (8) sub-contractors.

Collectively the team has over twenty (20) years' experience in sustainable design, construction management, renewable energy and other supporting works having worked in multiple Caribbean islands to include Antigua, Grenada.
Those engaged to provide construction services perform duties in the following areas: masonry, PV installations, electrician, and carpentry.

To bring the project to its desired outcome the following fixtures and fittings at the total cost of

1. Cutter
2. Office Desk & Chair
3. Stainless Steel Shelves
4. Hanging system
5. Band Saw
6. Industrial stainless-steel sink
7. Stainless steel table(s)
8. Automated scale
9. Solar panel

Table 7: Activity List: (Compiled by Author)

TM Fishing Cold Storage Facility, Loubiere, St. George, Commonwealth of Dominica		
WBS	**Activity (Level 2)**	**Activity (Level 3**
1	Preliminary	1.1 Sign contract 1.2 Submit bond and insurance documents 1.3 Prepare and submit project schedule 1.4 Prepare and submit schedule of cost 1.5 Obtain building permits 1.6 Submission of monthly payment requests
2	Long Lead Procurement	2.1 Order long lead items - Roofing 2.2 Order long lead items – cold storage insulation material 2.3 Order long lead items – plumbing 2.4 Order long lead items – electric 2.5 Order long lead items- PV panels and installation accessories
3	Temporary Site Facilities	3.1 Install temporary power 3.2 Install temporary water 3.3 Set up site office 3.4 Set up temporary shelters 3.5 Prepare site : lay down yard and temporary fencing
4	Site Grading and Utilities	4.1 Clear and grub site 4.2 Stone site access & temporary parking 4.3 Rough grade site (cut & fill) 4.4 Install storm drainage 4.5 perform final site grading 4.6 Erect building batter boards & layout
5	Foundations	5.1 Excavate foundation 5.2 Install waterproofing, drains, reinforcement etc. 5.3 Set reinforcing and anchor bolts 5.4 Pour column piers and foundation 5.5 Cure piers and foundation 5.6 Strip wall forms 5.7 Strip column piers and foundation form
6	Ground Floor & Wall Openings	6.1 Erect rebars for block work 6.2 Lay Blocks with opening for walls 6.3 Fabricate and erect rebars for columns and beam 6.4 Form and pour Columns & beams 6.5 Cure Columns & Beams 6.6 Strip forms from Column & Beams
7	Form and Pour Concrete- Roof	7.1 Form Roof Slab 7.2 Install rebar and in-roof utilities (Electrical) 7.3 Pour roof slab 7.4 Cure roof slab 7.5 Strip form from roof slab
8	Masonry Work	8.1 Construct Manholes, septic tanks and waste chambers 8.2 Rough-in Plumbing in toilet and Kitchen 8.3 Lay Masonry work at core, mechanical & toilets 8.4 Install interior masonry work 8.5 Clean masonry work

WBS	Activity (Level 2)	Activity (Level 3
9	Roofing	9.1 Install roofing flashing at parapet walls 9.2 Install roof drains and guttering 9.3 Waterproofing concrete roof
10	Windows, Doors & Front Closures	10.1 Install windows and Hardware 10.2 Install interior doors and hardware 10.3 Install Exterior door & hardware 10.4 Install Roller Door
11	Cold Room Insulation	11.1 Install wooden framing on floor slab 11.2 Install foam panels on concrete slab 11.3 Screed flooring 11.4 Cure flooring 11.5 Install framing on walls and ceiling 11.6 Install foam panels on wall and ceiling 11.7 Install Drainage & Vent 11.8 Install Metal Sheeting 11.9 Install temperature control hardware & Cold room Door 11.10 Testing & Inspection
12	Building Finishes	12.1 Rough-in plumbing in block walls 12.2 Sitting of external Waste pipes 12.3 Set plumbing fixtures and trim 12.4 Flush, test, and clean piping and fixtures
13	Plumbing	13.1 Rough-in electrical in masonry walls 13.2 Pull wire in conduit and set area transformers 13.3 Install and terminate electrical devices 13.4 Install light fixtures - test and clean
14	Electrical	14.1 Rough-in electrical in masonry walls 14.2 Pull wire in conduit and set area transformers 4.3 Install and terminate electrical devices 14.4 Install light fixtures- text and clean
15	Solar Panel Installation	15.1Racking and mounting Equipment 15.2 Solar Panel Install 15.3 Install microwave inverter, Electrical system, Enphase monitor 15.4 System Testing & Inspection
16	Clean UP	16.1 Remove debris from building and do final clean-up 16.2 Substantial completion date
17	Complete Final Inspection	17.1 Complete punch list from all inspections 17.2 Obtain certificate of occupancy 17.3 Issue final completion documents

WORK BREAKDOWN STRUCTURE

To maximize resources for greater efficiency and for effective management works will be broken down into packages. Workdays will not exceed five (5) days a week or forty (40) hours.

The project is broken down into sixteen steps; each phase is further broken down to work packages. that clearly outline the associated tasks/activities for execution (See chart 2 below).

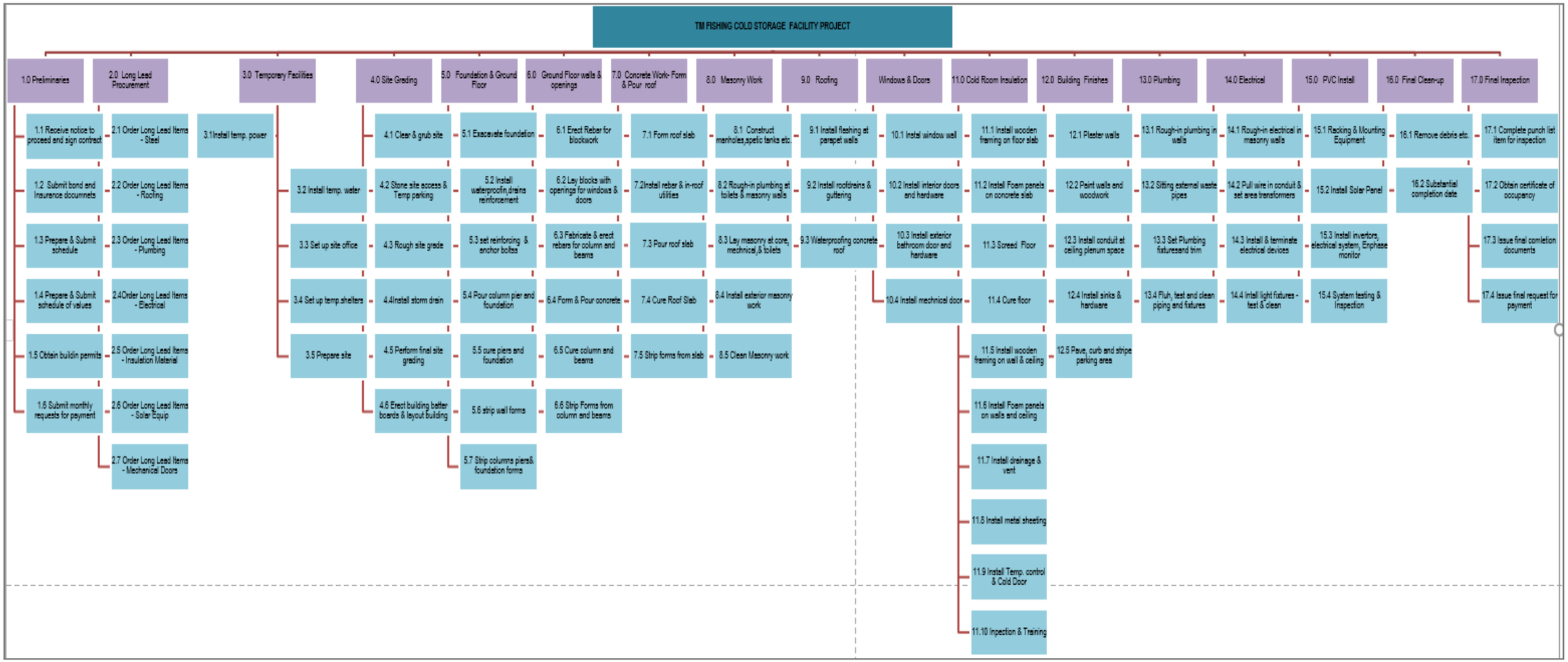


Chart 2: Work Breakdown Structure (Compiled by Author)

WORK BREAK DOWN DICTIONARY

According to Simplilearn (2019), the WBS dictionary is best describe as a document that provides detailed context relevant to each element in the WBS. The dictionary is expected to present a brief description of the project scope, defined and agreed upon deliverables, associated activities and indicators. Further too, the document will depict clearly assigned responsibility for activities/ deliverables and associated durations. It can also include information such as responsible organization, start and end dates, resources required, an estimate of cost, charge number, contract information, quality requirements, and technical references to facilitate the performance of the work.

Table 8: Work Break Down Dictionary (Source)

	WBS DICTIONARY								
Project Title: _____ Date Prepared: _____									
Work Package Name:			Code of Account:						
Description of Work			Assumptions & Constraints:						
Milestones: 1.			Due Dates						
ID	Activity	Resource	Labour			Material			Total Cost
			Hours	Rate	Total	Units	Cost	Total	
Quality Requirements:									
Acceptance Criteria:									
Technical References:									
Agreement Information:									

SCOPE CONTROL

The Project Manager and the project team will work together to control of the scope of the project. The project team will leverage the WBS Dictionary by using it as a statement of work for each WBS element. The project team will ensure that they perform only the work described in the WBS dictionary and generate the defined deliverables for each WBS element. The Project Manager will oversee the project team and the progression of the project to ensure that this scope control process if followed.

4.3. TIME MANAGEMENT PLAN

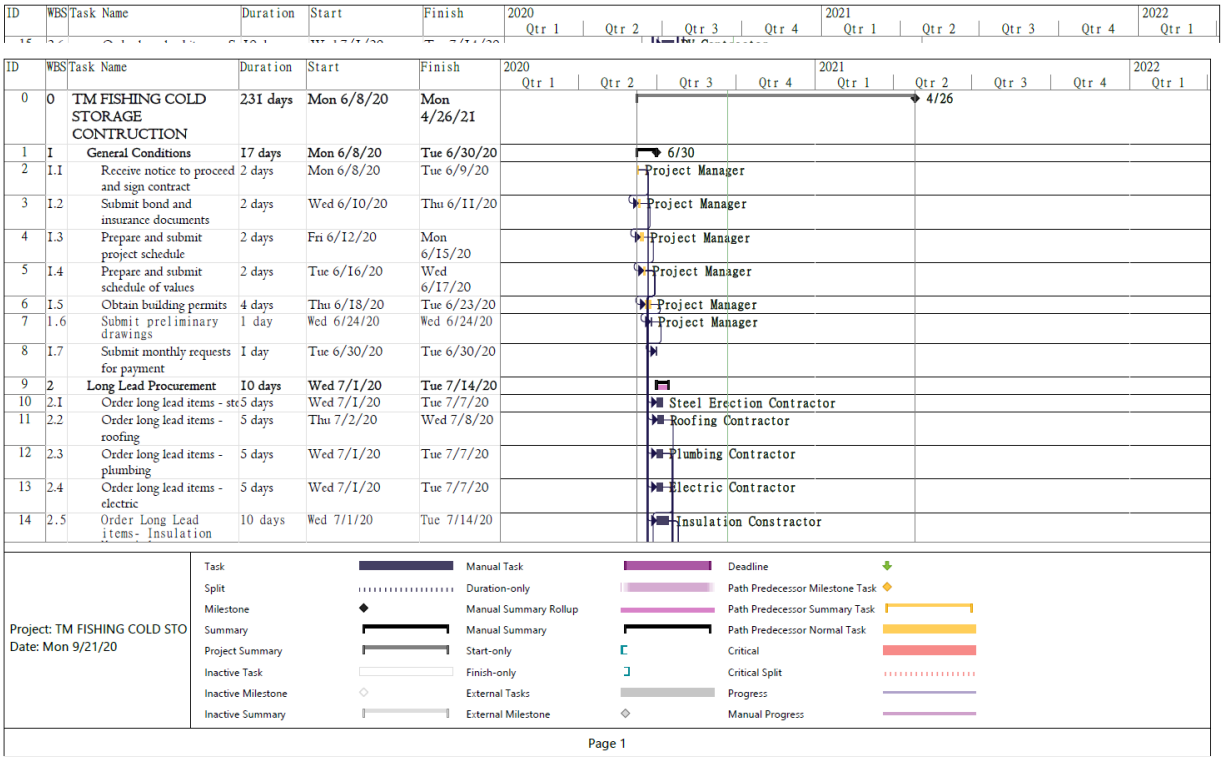
The owner has expressed urgency for completion of this project and thus all decision made there-in is informed by this. In order to satisfy the requests of the client as much as is reasonable, the project team has incorporated a series of schedule compression technique to this end. These tools/techniques are advantageous multiple reasons to include allowing for the clear definition of time taken by each activity as well as identification of leads and lags associations. As per Lead and lag are both used in the development of the project schedule. Lead is an acceleration of the successor activity and can be used only on finish-to-start activity relationships. Lag is a delay in the successor activity and can be found on all activity relationship types.

As per (PMI, 2018) Schedule Compression is used to reduce the implementation time line of a project without compromising the project scope. The primary justification for employing schedule compression techniques in this scenario to 1) allow for the company to take advantage of peak harvest/catch season for high priced commodity and 2) to mitigate against the negative impacts of the hurricane season which runs from June to September.

Table 9: Project Calendar(Compiled by Author)

PROJECT CALENDAR								
PROJECT NAME:								
PROJECT PARTICULARS								**NOTES**
PROJECT CODE: FGP 1	**PROJECT MANAGER**: ALISON E ALFRED	**PROJECT START**: JUNE 08 2020	STANDARD Y N SHIFT OVERTIME					
COUNTRY: DOMINICA	**PROJECT SPONSOR**: TM FISHING INC.	**PROJECT END** MAY 2021	**UNITS** WORK: HOUR DURATION: DAY					
DAYS PER MONTH: 20	WORK WEEK							
HOURS PER DAY: 8	SUN	MON	TUES	WED	THUS	FRI	SAT	
LUNCH TIME:1 hr	WORK HOURS: 8:00-1:00, 2:00-4; 00P.M.							
DATE FORMAT	TIME FORMAT: 12HR	TIME ZONE						
NONE WORKING TIMES & HOLIDAY								
DESCRIPTION	START	END						
INDEPENDENCE	NOV 4TH 2020	NOV 5TH 2020						
CHRISTMAS	25TH DEC 2020	26TH DEC 2020						
NEW YEAR'S DAY	JAN 1ST 2021	JAN 1ST 2021						
CARNIVAL	FEB 15TH 2021	FEB 16TH 2021						
ASH WEDNESDAY	FEB 17TH 2021	FEB 17TH 2021						
GOOD FRIDAY & EASTER MONDAY	APRIL 1ST	APRIL 5TH 2021						
LABOUR DAY	MAY 3RD 2021	MAY 3RD 2021						

PROJECT TIMELINE



ID	WBS	Task Name	Duration	Start	Finish
0	0	TM FISHING COLD STORAGE CONTRUCTION	231 days	Mon 6/8/20	Mon 4/26/21
1	I	General Conditions	17 days	Mon 6/8/20	Tue 6/30/20
2	I.I	Receive notice to proceed and sign contract	2 days	Mon 6/8/20	Tue 6/9/20
3	I.2	Submit bond and insurance documents	2 days	Wed 6/10/20	Thu 6/11/20
4	I.3	Prepare and submit project schedule	2 days	Fri 6/12/20	Mon 6/15/20
5	I.4	Prepare and submit schedule of values	2 days	Tue 6/16/20	Wed 6/17/20
6	I.5	Obtain building permits	4 days	Thu 6/18/20	Tue 6/23/20
7	1.6	Submit preliminary drawings	1 day	Wed 6/24/20	Wed 6/24/20
8	I.7	Submit monthly requests for payment	I day	Tue 6/30/20	Tue 6/30/20
9	2	Long Lead Procurement	10 days	Wed 7/1/20	Tue 7/14/20
10	2.I	Order long lead items - ste	5 days	Wed 7/1/20	Tue 7/7/20
11	2.2	Order long lead items - roofing	5 days	Thu 7/2/20	Wed 7/8/20
12	2.3	Order long lead items - plumbing	5 days	Wed 7/1/20	Tue 7/7/20
13	2.4	Order long lead items - electric	5 days	Wed 7/1/20	Tue 7/7/20
14	2.5	Order Long Lead items- Insulation	10 days	Wed 7/1/20	Tue 7/14/20

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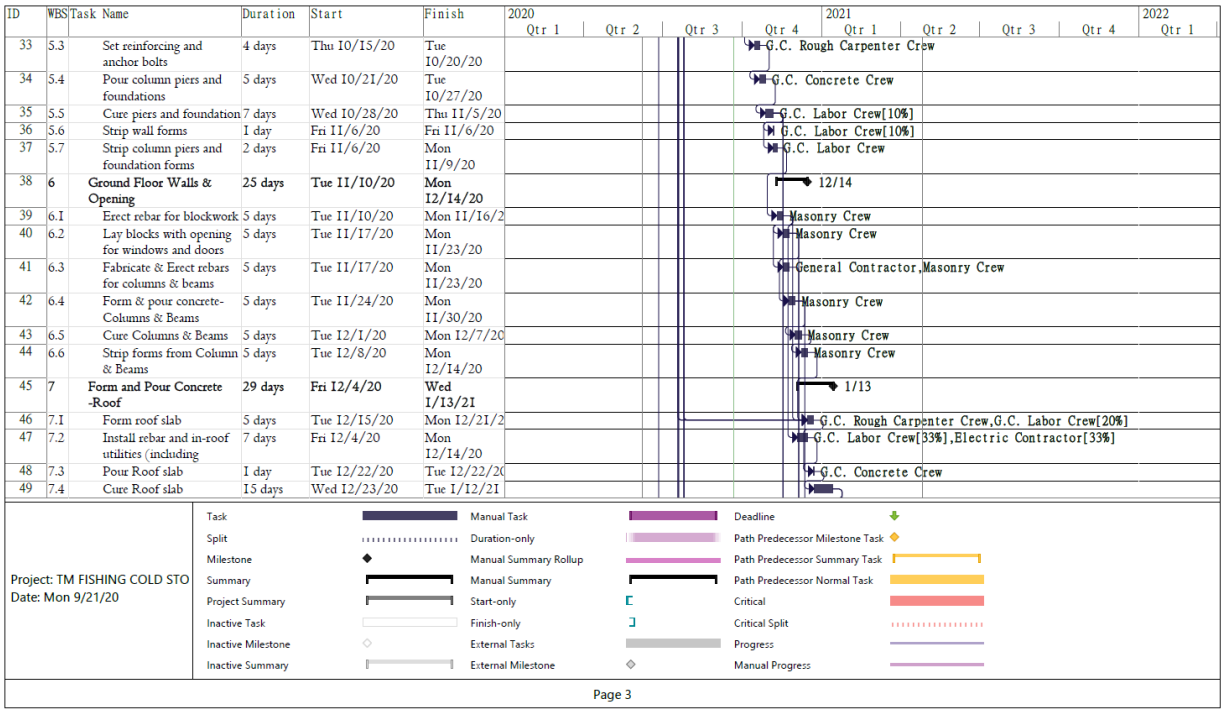

ID	WBS	Task Name	Duration	Start	Finish
33	5.3	Set reinforcing and anchor bolts	4 days	Thu I0/I5/20	Tue I0/20/20
34	5.4	Pour column piers and foundations	5 days	Wed I0/21/20	Tue I0/27/20
35	5.5	Cure piers and foundation	7 days	Wed I0/28/20	Thu II/5/20
36	5.6	Strip wall forms	I day	Fri II/6/20	Fri II/6/20
37	5.7	Strip column piers and foundation forms	2 days	Fri II/6/20	Mon II/9/20
38	6	Ground Floor Walls & Opening	25 days	Tue II/I0/20	Mon I2/I4/20
39	6.I	Erect rebar for blockwork	5 days	Tue II/I0/20	Mon II/16/2
40	6.2	Lay blocks with opening for windows and doors	5 days	Tue II/I7/20	Mon II/23/20
41	6.3	Fabricate & Erect rebars for columns & beams	5 days	Tue II/I7/20	Mon II/23/20
42	6.4	Form & pour concrete-Columns & Beams	5 days	Tue II/24/20	Mon II/30/20
43	6.5	Cure Columns & Beams	5 days	Tue I2/I/20	Mon I2/7/20
44	6.6	Strip forms from Column & Beams	5 days	Tue I2/8/20	Mon I2/I4/20
45	7	Form and Pour Concrete -Roof	29 days	Fri I2/4/20	Wed I/I3/21
46	7.I	Form roof slab	5 days	Tue I2/I5/20	Mon I2/21/2
47	7.2	Install rebar and in-roof utilities (including	7 days	Fri I2/4/20	Mon I2/I4/20
48	7.3	Pour Roof slab	I day	Tue I2/22/20	Tue I2/22/20
49	7.4	Cure Roof slab	I5 days	Wed I2/23/20	Tue I/I2/21

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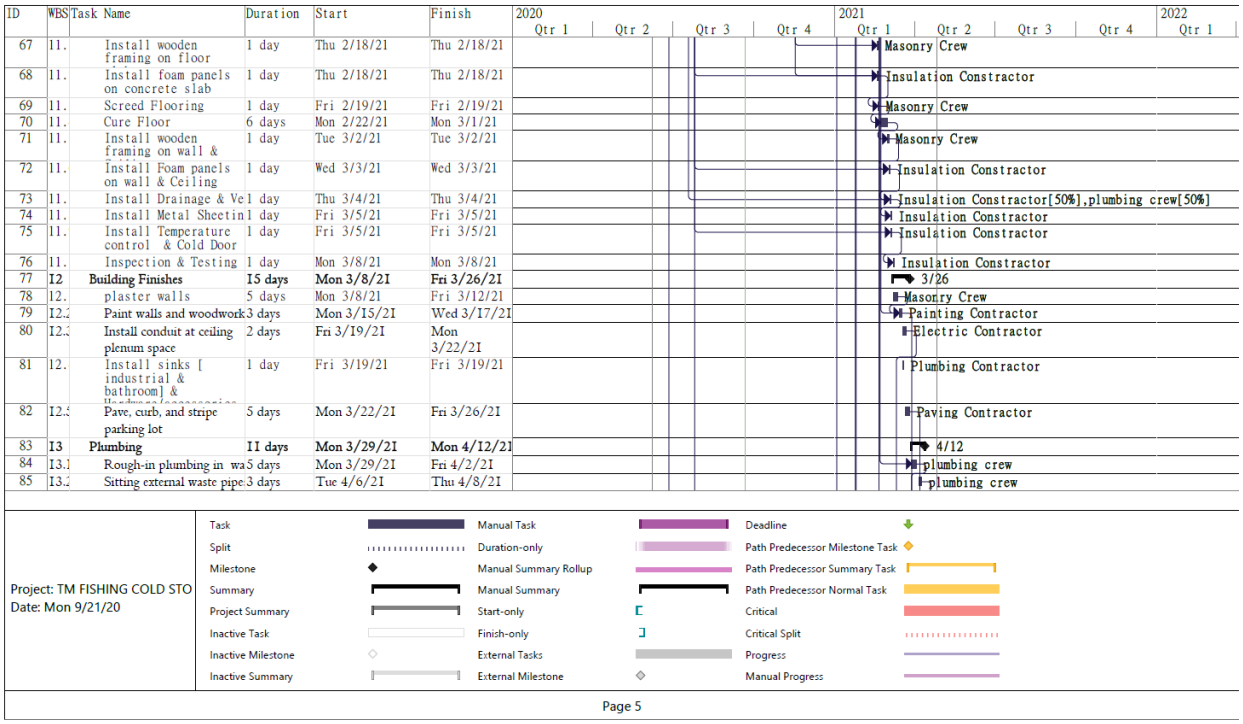
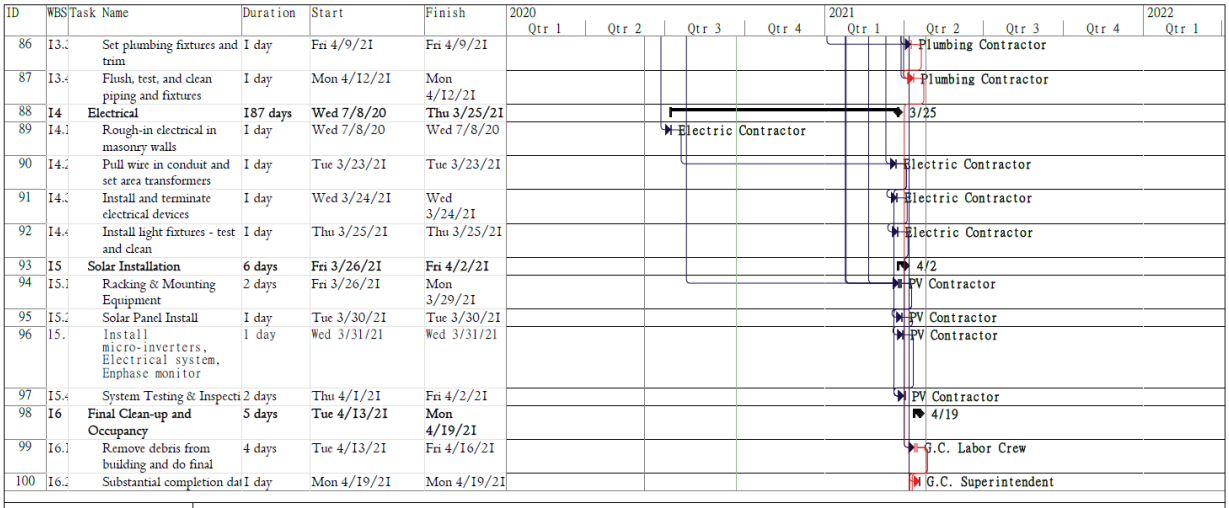


ID	WBS	Task Name	Duration	Start	Finish
67	11.	Install wooden framing on floor	1 day	Thu 2/18/21	Thu 2/18/21
68	11.	Install foam panels on concrete slab	1 day	Thu 2/18/21	Thu 2/18/21
69	11.	Screed Flooring	1 day	Fri 2/19/21	Fri 2/19/21
70	11.	Cure Floor	6 days	Mon 2/22/21	Mon 3/1/21
71	11.	Install wooden framing on wall &	1 day	Tue 3/2/21	Tue 3/2/21
72	11.	Install Foam panels on wall & Ceiling	1 day	Wed 3/3/21	Wed 3/3/21
73	11.	Install Drainage & Ve	1 day	Thu 3/4/21	Thu 3/4/21
74	11.	Install Metal Sheetin	1 day	Fri 3/5/21	Fri 3/5/21
75	11.	Install Temperature control & Cold Door	1 day	Fri 3/5/21	Fri 3/5/21
76	11.	Inspection & Testing	1 day	Mon 3/8/21	Mon 3/8/21
77	**12**	**Building Finishes**	**15 days**	**Mon 3/8/21**	**Fri 3/26/21**
78	12.	plaster walls	5 days	Mon 3/8/21	Fri 3/12/21
79	12.	Paint walls and woodwork	3 days	Mon 3/15/21	Wed 3/17/21
80	12.	Install conduit at ceiling plenum space	2 days	Fri 3/19/21	Mon 3/22/21
81	12.	Install sinks [industrial & bathroom] &	1 day	Fri 3/19/21	Fri 3/19/21
82	12.	Pave, curb, and stripe parking lot	5 days	Mon 3/22/21	Fri 3/26/21
83	**13**	**Plumbing**	**11 days**	**Mon 3/29/21**	**Mon 4/12/21**
84	13.	Rough-in plumbing in wa	5 days	Mon 3/29/21	Fri 4/2/21
85	13.	Sitting external waste pipe	3 days	Tue 4/6/21	Thu 4/8/21

Project: TM FISHING COLD STO
Date: Mon 9/21/20

Task	Manual Task	Deadline	
Split	Duration-only	Path Predecessor Milestone Task	
Milestone	Manual Summary Rollup	Path Predecessor Summary Task	
Summary	Manual Summary	Path Predecessor Normal Task	
Project Summary	Start-only	Critical	
Inactive Task	Finish-only	Critical Split	
Inactive Milestone	External Tasks	Progress	
Inactive Summary	External Milestone	Manual Progress	



ID	WBS	Task Name	Duration	Start	Finish
86	13.	Set plumbing fixtures and trim	1 day	Fri 4/9/21	Fri 4/9/21
87	13.	Flush, test, and clean piping and fixtures	1 day	Mon 4/12/21	Mon 4/12/21
88	**14**	**Electrical**	**187 days**	**Wed 7/8/20**	**Thu 3/25/21**
89	14.	Rough-in electrical in masonry walls	1 day	Wed 7/8/20	Wed 7/8/20
90	14.	Pull wire in conduit and set area transformers	1 day	Tue 3/23/21	Tue 3/23/21
91	14.	Install and terminate electrical devices	1 day	Wed 3/24/21	Wed 3/24/21
92	14.	Install light fixtures - test and clean	1 day	Thu 3/25/21	Thu 3/25/21
93	**15**	**Solar Installation**	**6 days**	**Fri 3/26/21**	**Fri 4/2/21**
94	15.	Racking & Mounting Equipment	2 days	Fri 3/26/21	Mon 3/29/21
95	15.	Solar Panel Install	1 day	Tue 3/30/21	Tue 3/30/21
96	15.	Install micro-inverters, Electrical system, Enphase monitor	1 day	Wed 3/31/21	Wed 3/31/21
97	15.	System Testing & Inspecti	2 days	Thu 4/1/21	Fri 4/2/21
98	**16**	**Final Clean-up and Occupancy**	**5 days**	**Tue 4/13/21**	**Mon 4/19/21**
99	16.	Remove debris from building and do final	4 days	Tue 4/13/21	Fri 4/16/21
100	16.	Substantial completion dat	1 day	Mon 4/19/21	Mon 4/19/21

Project: TM FISHING COLD STO
Date: Mon 9/21/20

Task	Manual Task	Deadline	
Split	Duration-only	Path Predecessor Milestone Task	
Milestone	Manual Summary Rollup	Path Predecessor Summary Task	
Summary	Manual Summary	Path Predecessor Normal Task	
Project Summary	Start-only	Critical	
Inactive Task	Finish-only	Critical Split	
Inactive Milestone	External Tasks	Progress	
Inactive Summary	External Milestone	Manual Progress	

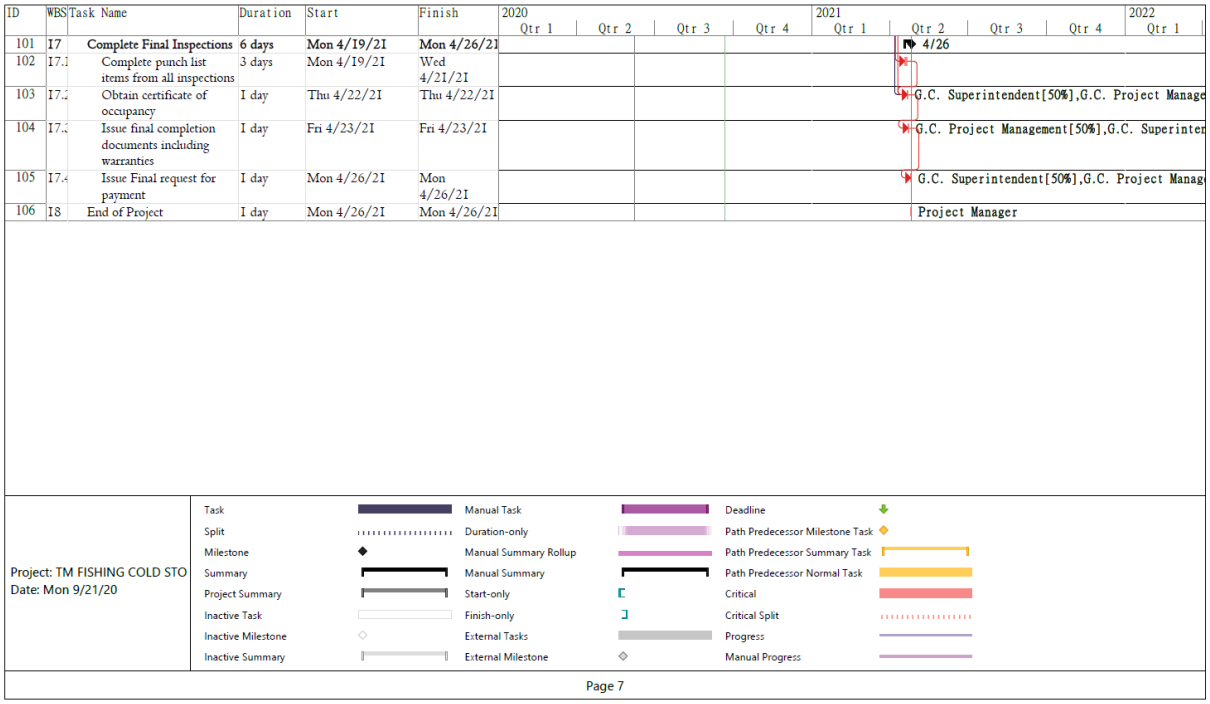


Figure 4: Project Timeline

4.4 SUSTAINABLE PROJECT COST MANAGEMENT PLAN

ESTIMATE COSTS

Project costing is an involved and complicated activity that is influenced by several parameters and itself significantly impacts the success of the project implementation. Arriving at cost estimates for this particular project was informed by several approaches which included Quantity Surveyor Estimations as well as the use other estimation costing techniques to include Analogous and Three Point Estimate.
Billow, 2017 articulates that the accuracy of analogous estimation is directly correlated to the accuracy of data inputted and thus can improve project success between 30 and 60 percent.

The table below communicates an analysis conducted for this project on the principles of Analogous Estimation

Table 10 Cost Estimate Analysis (Compiled by Author)

COST ESTIMATE WORK SHEET TABLE					
Project	**Size of Previous**	**Cost of previous activities**	**Size of current Activity**	**Cost per square foot**	**Cost estimate of current activity**
TM Fishing Cold Storage	n/a	n/a	752sqft	325.75	244,964.00
Newtown Fisheries Complex			1000sqft	375.00	375,000.00
Fond Cole Fisheries complex			525sqft	340.00	170,625.00
THREE POINT ESTIMATE					
FORMULA	Triangular Distribution: E=(O=4ML+P)/3 Beta Distribution (PERT)E= (O+4ML+P)/6 NOTE: E=Effort, O= optimistic, ML=Most Likely, P=Pessimistic				
Value: (Cost per sqft)	Optimistic	Most Likely		Pessimistic	
	325.75	(325.75+375+340)=346.92		400.00	
CALCULATIONS: (PERT)	(325.75+(4x346.92)+400)/6=352.24				
	Activity cost estimate		352.24x752=264,884.48		

Table 11 Project Budget (Compiled by Author)

PROJECT BUDGET
COST ESTIMATION

Project Management Plan for Cold Storage Facility for TM Fishing Inc.

Project Code	Project Manager: Alison E Alfred	Project Start: June 8 2020		ESTIMATION TECHNIQUE:
Location: Commonwealth of Dominica	PROJECT SPONSOR: TM Fishing Inc.	Project Finish:	Units: Work: Hours Duration: Day Cost: Eastern Caribbean Dollars (XCD) Accuracy: Nearest Dollar	• Analogous • Three Point Estimation
Day per month: 20	HOURS PER DAY: 8	MEASUREMENT: Imperial		

BUDGET ESTIMATE

ID	DESCRIPTION	VALUE (EC$)	NOTES
1	Activity Cost Estimate	262,848.00	The analogous technique was employed to allow for a determination of values per square foot. All previous sqft. price was multiplied by the total square footage of the new building. The Pessimistic value project is the highest of the three options, whereas the optimistic value is the lower of the three and the Most likely value is best described as an average of the three.
2	Contingency Reserve (10%)	262,848.00x10%= 26,284.8	
3	Work Package Cost	= Activity Cost Estimate +Contingency 262,848.00+26,284.80=289,134.00	
4	Contingency Reserve (10%)	WKP x10% 2289,134.00x 0.10=28,913.00	
5	Baseline Costs	WKP + Contingency Reserve 289,134.00+28,912.00 318,047.00	
6	Management Reserve (10%)	Baseline cost estimate x 10% 318,047.00 x10%=31,805.00	
7	PROJECT BUDGET	=Baseline Cost + Management Reserve 318,047.00+31,805=348,852.00	

Degree of Confidence	Project Management team has 95% confidence that actual costs will not exceed the proposed budget

Table 12. Budget Breakdown and Control (Source: Compiled by Author)

ACTIVITIES		SCHEDULE					CONTROL DATE
WBS	Task Name	Schedule (days)	Schedule (hours)	Workpackage	Labour (40%)	Material (60%)	Milestone
1	General Conditions	14	112	0	-	-	Tue 6/30/20
2	Long Lead Procurement	10	80	0	-	-	Tue 7/7/20
3	Temporary Site Facilities	12	96	14,122.00	5,648.80	8,473.20	Thu 7/30/20
4	Site Grading and Utilities	40	320	9,000.00	3,600.00	5,400.00	Fri 9/4/20
5	Foundations & Ground Floor	33	264	42,365.00	16,946.00	25,419.00	Tue 10/20/20
6	Ground Floor Walls & Opening	30	240	9,600.00	3,840.00	5,760.00	Thu 11/26/20
7	Form and Pour Concrete -Roof	29	232	38,699.00	15,479.60	23,219.40	Wed 1/6/21
8	Masonry Work	23	184	17,722.00	7,088.80	10,633.20	Tue 1/19/21
9	Roofing	11	88	2,500.00	1,000.00	1,500.00	Mon 2/8/21
10	Windows, Doors and front closures	4	32	10,915.00	4,366.00	6,549.00	Thu 2/18/21
11	Cold Room Insulation	15	120	16,920.00	6,768.00	10,152.00	Mon 3/8/21
12	Building Finishes	16	128	23,014.00	9,205.60	13,808.40	Fri 3/26/21
13	Plumbing	10	80	6,520.00	2,608.00	3,912.00	Mon 4/12/21
14	Electrical	4	32	6,120.00	2,448.00	3,672.00	Thu 3/25/21
15	Solar Installation	6	48	71,920.00	28,768.00	43,152.00	Fri 4/2/21
16	Final Clean-up and Occupancy	5	40	1,392.00	1,392.00	-	Mon 4/19/21
17	Complete Final Inspections	12	96	600.00	600.00	-	Tue 5/4/2021
SUB TOTAL		274	2192	271,409.00	109,758.80	161,650.20	
Administrative Cost : 20%				54,281.80	-		
TOTAL				325,690.80	-	-	
RESERVE:					-	-	
Contingency Cost: 10%				32,569.08	-	-	
Management Reserve: 10%				32,569.08	-	-	

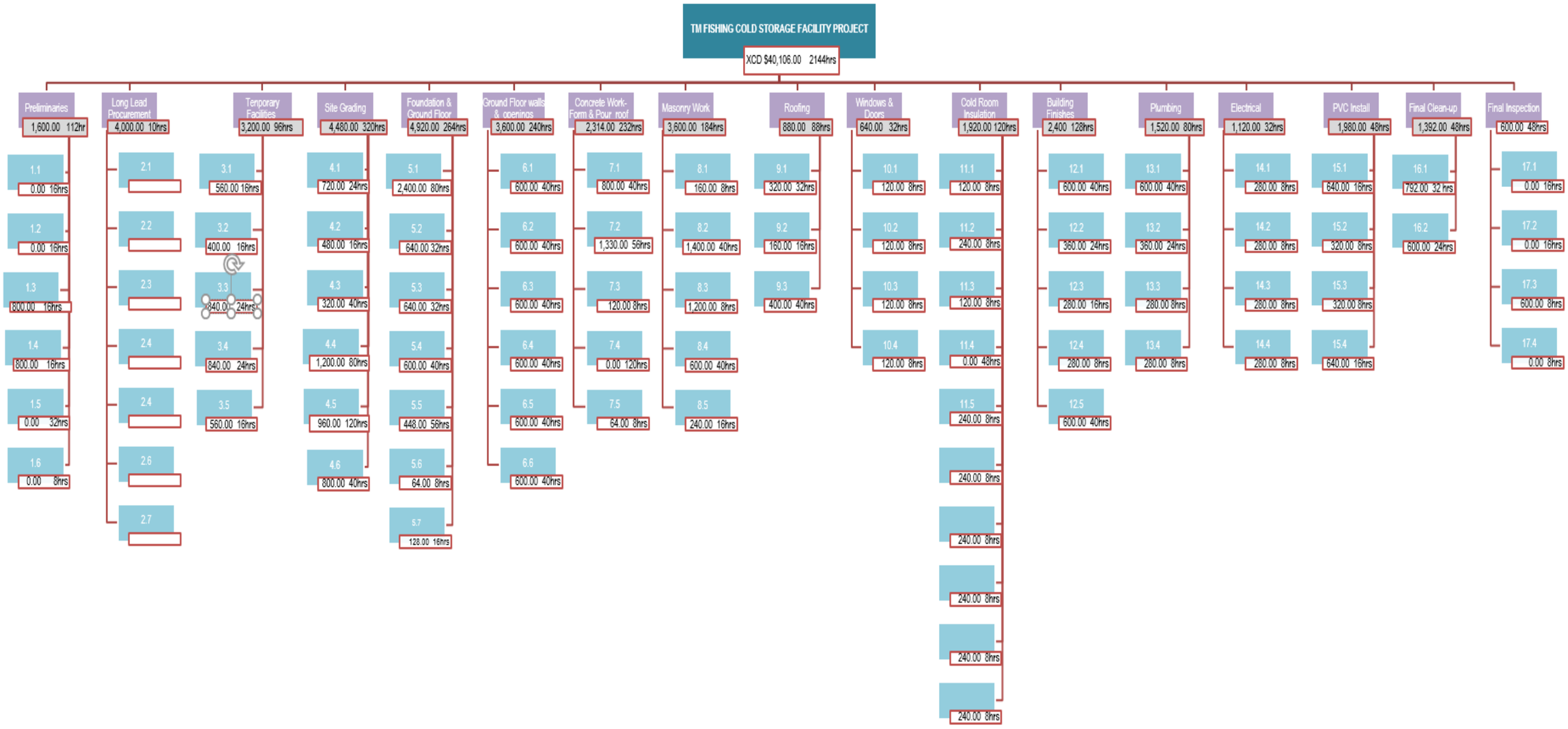


Chart 3: Cost Breakdown Structure (Compiled by Author)

Table 13 Resource Baseline Cost

RESOURCE BASELINE COST

WBS	Task Name	Resource Initials	Start	Finish	Duration	Work(hrs)	Cost	Baseline Start	Baseline Finish	Baseline Duration	Baseline Work	Baseline Cost	Start Variance	Finish Variance	Duration Variance	Work Variance	Cost Variance
0	TM FISHING COLD STORAGE CONTRUCTION		Mon 6/8/20	Tue 5/4/21	268	2144	40,106.00	Mon 6/8/20	Tue 5/4/21	268	2144	40,106.00					
1	General Conditions		Mon 6/8/20	Tue 6/30/20	14	112	1,600.00	Mon 6/8/20	Tue 6/30/20	14	112	1,600.00					
1.1	Receive notice to proceed and sign contract	PM	Mon 6/8/20	Tue 6/9/20	2	16		Mon 6/8/20	Tue 6/9/20	2	16						
1.2	Submit bond and insurance documents	PM	Wed 6/10/20	Thu 6/11/20	2	16		Wed 6/10/20	Thu 6/11/20	2	16						
1.3	Prepare and submit project schedule	PMT	Fri 6/12/20	Mon 6/15/20	2	16	800.00	Fri 6/12/20	Mon 6/15/20	2	16	800.00					
1.4	Prepare and submit schedule of values	PMT	Tue 6/16/20	Wed 6/17/20	2	16	800.00	Tue 6/16/20	Wed 6/17/20	2	16						
1.5	Obtain building permits	PM	Thu 6/18/20	Tue 6/23/20	4	32		Thu 6/18/20	Tue 6/23/20	4	32						
1.6	Submit preliminary drawings	PM	Wed 6/24/20	Wed 6/24/20	1	8		Wed 6/24/20	Wed 6/24/20	1	8						
1.7	Submit monthly requests for payment		Tue 6/30/20	Tue 6/30/20	1	8		Tue 6/30/20	Tue 6/30/20	1	8						
2	Long Lead Procurement		Wed 7/1/20	Tue 7/7/20	10	80	4,000.00	Wed 7/1/20	Tue 7/7/20	10	80	4,000.00					
2.1	Order long lead items - steel	PO/PM	Wed 7/1/20	Tue 7/7/20	5	40		Wed 7/1/20	Tue 7/7/20	5	40						
2.2	Order long lead items - roofing	PO/PM	Thu 7/2/20	Wed 7/8/20	5	40		Thu 7/2/20	Wed 7/8/20	5	40						
2.3	Order long lead items - plumbing	PO/PM	Wed 7/1/20	Tue 7/7/20	5	40		Wed 7/1/20	Tue 7/7/20	5	40						
2.4	Order long lead items - electric	PO/PM	Wed 7/1/20	Tue 7/7/20	5	40		Wed 7/1/20	Tue 7/7/20	5	40						
2.5	Order Long Lead items- Insulation Material	PO/PM	Wed 7/1/20	Tue 7/14/20	10	80		Wed 7/1/20	Tue 7/14/20	10	80						
2.6	Order long lead items - Solar	PO/PM	Wed	Tue	10	80		Wed	Tue	10	80						

			7/1/20	7/14/20				7/1/20	7/14/20								
2.7	Order long lead items- Mechanical doors	PO/PM	Wed 7/1/20	Tue 7/7/20	5	40		Wed 7/1/20	Tue 7/7/20	5	40						
3	**Temporary Site Facilities**		**Wed 7/15/20**	**Thu 7/30/20**	**12**	**96**	**3,200.00**	**Wed 7/15/20**	**Thu 7/30/20**	**12**	**96**	**3,200.00**					
3.1	Install temporary power	EC	Wed 7/15/20	Thu 7/16/20	2	16	560.00	Wed 7/15/20	Thu 7/16/20	2	16	560.00					
3.2	Install temporary water service	P	Fri 7/17/20	Mon 7/20/20	2	16	400.00	Fri 7/17/20	Mon 7/20/20	2	16	400.00					
3.3	Set up site office	M	Tue 7/21/20	Thu 7/23/20	3	24	840.00	Tue 7/21/20	Thu 7/23/20	3	24	840.00					
3.4	Setup temporary Shelters	M	Fri 7/24/20	Tue 7/28/20	3	24	840.00	Fri 7/24/20	Tue 7/28/20	3	24	840.00					
3.5	Prepare site - lay down yard and temporary fencing	M	Wed 7/29/20	Thu 7/30/20	2	16	560.00	Wed 7/29/20	Thu 7/30/20	2	16	560.00					
4	**Site Grading and Utilities**		**Fri 7/31/20**	**Fri 9/4/20**	**40**	**320**	**4,480.00**	**Fri 7/31/20**	**Fri 9/4/20**	**40**	**320**	**4,480.00**					
4.1	Clear and grub site	S	Fri 7/31/20	Tue 8/4/20	3	24	720.00	Fri 7/31/20	Tue 8/4/20	3	24	720.00					
4.2	Stone site access and temporary parking area	S	Wed 8/5/20	Thu 8/6/20	2	16	480.00	Wed 8/5/20	Thu 8/6/20	2	16	480.00					
4.3	Rough grade site (cut and fill)	LC	Fri 8/7/20	Thu 8/13/20	5	40	320.00	Fri 8/7/20	Thu 8/13/20	5	40	320.00					
4.4	Install storm drainage	MC	Fri 8/14/20	Thu 8/27/20	10	80	1,200.00	Fri 8/14/20	Thu 8/27/20	10	80	1,200.00					
4.5	Perform final site grading	LC	Mon 8/10/20	Fri 8/28/20	15	120	960.00	Mon 8/10/20	Fri 8/28/20	15	120	960.00					
4.6	Erect building batter boards and layout building	CC	Mon 8/31/20	Fri 9/4/20	5	40	800.00	Mon 8/31/20	Fri 9/4/20	5	40	800.00					

RESOURCE BASELINE COST																	
WBS	Task Name	-	Start	Finish	Duration	Work(hrs)	Cost	Baseline Start	Baseline Finish	Baseline Duration	Baseline Work	Baseline Cost	Start Variance	Finish Variance	Duration Variance	Work Variance	Cost Variance
5	**Foundations & Ground Floor**		**Mon 9/7/20**	**Tue 10/20/20**	**33**	**264**	**4,920.00**	**Mon 9/7/20**	**Tue 10/20/20**	**33**	**264**	**4,920.00**					
5.1	Excavate foundations	S	Mon 9/7/20	Fri 9/18/20	10	80	2,400.00	Mon 9/7/20	Fri 9/18/20	10	80	2,400.00					
5.2	Install waterproofing, drains, reinforcements etc.	CC	Mon 9/21/20	Thu 9/24/20	4	32	640.00	Mon 9/21/20	Thu 9/24/20	4	32	640.00					
5.3	Set reinforcing and anchor bolts	CC	Fri 9/25/20	Wed 9/30/20	4	32	640.00	Fri 9/25/20	Wed 9/30/20	4	32	640.00					
5.4	Pour column piers and foundations	MC	Thu 10/1/20	Wed 10/7/20	5	40	600.00	Thu 10/1/20	Wed 10/7/20	5	40	600.00					
5.5	Cure piers and foundations	LC	Thu 10/8/20	Fri 10/16/20	7	56	448.00	Thu 10/8/20	Fri 10/16/20	7	56	448.00					
5.6	Strip wall forms	LC	Mon 10/19/20	Mon 10/19/20	1	8	64.00	Mon 10/19/20	Mon 10/19/20	1	8	64.00					
5.7	Strip column piers and foundation forms	LC	Mon 10/19/20	Tue 10/20/20	2	16	128.00	Mon 10/19/20	Tue 10/20/20	2	16	128.00					
6	**Ground Floor Walls & Opening**		**Wed 10/21/20**	**Thu 11/26/20**	**30**	**240**	**3,600.00**	**Wed 10/21/20**	**Thu 11/26/20**	**30**	**240**	**3,600.00**					
6.1	Erect rebar for blockwork	MC	Wed 10/21/20	Tue 10/27/20	5	40	600.00	Wed 10/21/20	Tue 10/27/20	5	40	600.00					
6.2	Lay blocks with opening for windows and doors	MC	Wed 10/28/20	Tue 11/3/20	5	40	600.00	Wed 10/28/20	Tue 11/3/20	5	40	600.00					
6.3	Fabricate & Erect rebars for columns & beams	G.C, MC	Wed 10/28/20	Tue 11/3/20	5	40	600.00	Wed 10/28/20	Tue 11/3/20	5	40	600.00					
6.4	Form & pour concrete-Columns & Beams	MC	Fri 11/6/20	Thu 11/12/20	5	40	600.00	Fri 11/6/20	Thu 11/12/20	5	40	600.00					
6.5	Cure Columns & Beams	MC	Fri 11/13/20	Thu 11/19/20	5	40	600.00	Fri 11/13/20	Thu 11/19/20	5	40	600.00					
6.6	Strip forms from Column & Beams	MC	Fri 11/20/20	Thu 11/26/20	5	40	600.00	Fri 11/20/20	Thu 11/26/20	5	40	600.00					
7	**Form and Pour Concrete -Roof**		**Fri 11/27/20**	**Wed 1/6/21**	**29**	**232**	**2,314.00**	**Fri 11/27/20**	**Wed 1/6/21**	**29**	**232**	**2,314.00**					

7.1	Form roof slab	GC	Fri 11/27/20	Thu 12/3/20	5	40	800.00	Fri 11/27/20	Thu 12/3/20	5	40	800.00					
7.2	Install rebar and in-roof utilities (including electrical)	GC, EC	Fri 12/4/20	Mon 12/14/20	7	56	1,330.00	Fri 12/4/20	Mon 12/14/20	7	56	1,330.00					
7.3	Pour Roof slab	MC	Tue 12/15/20	Tue 12/15/20	1	8	120.00	Tue 12/15/20	Tue 12/15/20	1	8	120.00					
7.4	Cure Roof slab		Wed 12/16/20	Tue 1/5/21	15	120		Wed 12/16/20	Tue 1/5/21	15	120						
7.5	Strip forms from roof slab	G	Wed 1/6/21	Wed 1/6/21	1	8	64.00	Wed 1/6/21	Wed 1/6/21	1	8	64.00					
8	**Masonry Work**		**Tue 12/15/20**	**Tue 1/19/21**	**23**	**184**	3,600.00	**Tue 12/15/20**	**Tue 1/19/21**	**23**	**184**	**3,600.00**					
8.1	Construct Manholes, Spectic tank & waste chambers	P, MC	Tue 12/15/20	Tue 12/15/20	1	8	160.00	Tue 12/15/20	Tue 12/15/20	1	8	160.00					
8.2	Rough-in plumbing at toilets and masonry walls	P		Tue 12/22/20	5	40	1,400.00		Tue 12/22/20	5	40	1,400.00					
8.3	Lay masonry at core, mechanical, and toilets	MC	Mon 12/28/20	Fri 1/8/21	10	80	1,200.00	Mon 12/28/20	Fri 1/8/21	10	80	1,200.00					
8.4	Install exterior masonry work	MC	Mon 1/11/21	Fri 1/15/21	5	40	600.00	Mon 1/11/21	Fri 1/15/21	5	40	600.00					
8.5	Clean masonry	MC	Mon 1/18/21	Tue 1/19/21	2	16	240.00	Mon 1/18/21	Tue 1/19/21	2	16	240.00					
9	**Roofing**		**Mon 1/25/21**	**Mon 2/8/21**	**11**	**88**	**880.00**	**Mon 1/25/21**	**Mon 2/8/21**	**11**	**88**	**880.00**					
9.1	Install flashing at parapet walls	R	Mon 1/25/21	Thu 1/28/21	4	32	320.00	Mon 1/25/21	Thu 1/28/21	4	32	320.00					
9.2	Install roof drains & guttering	R	Fri 1/29/21	Mon 2/1/21	2	16	160.00	Fri 1/29/21	Mon 2/1/21	2	16	160.00					
9.3	Waterproofing concrete Roof	R	Tue 2/2/21	Mon 2/8/21	5	40	400.00	Tue 2/2/21	Mon 2/8/21	5	40	400.00					

RESOURCE BASELINE COST																	
WBS	Task Name	-	Start	Finish	Duration	Work(hrs)	Cost	Baseline Start	Baseline Finish	Baseline Duration	Baseline Work	Baseline Cost	Start Variance	Finish Variance	Duration Variance	Work Variance	Cost Variance
10	**Windows, Doors and front closures**		**Mon 2/15/21**	**Thu 2/18/21**	**4**	32	**640.00**	**Mon 2/15/21**	**Thu 2/18/21**	**4**	**32**	**640.00**					
10.1	Install window wall [Aluminum]	CC	Tue 2/9/21	Tue 2/9/21	1	8	120.00	Tue 2/9/21	Tue 2/9/21	1	8	120.00					
10.2	Install interior doors and hardware	CC	Wed 2/10/21	Wed 2/10/21	1	8	120.00	Wed 2/10/21	Wed 2/10/21	1	8	120.00					
10.3	Install Exterior Bathroom doors and hardware	CC	Thu 2/11/21	Thu 2/11/21	1	8	120.00	Thu 2/11/21	Thu 2/11/21	1	8	120.00					
10.4	Install Mechanical Door	GC	Mon 2/15/21	Mon 2/15/21	1	8	280.00	Mon 2/15/21	Mon 2/15/21	1	8	280.00					
11	**Cold Room Insulation**		**Thu 2/18/21**	**Mon 3/8/21**	**15**	120	1,920.00	**Thu 2/18/21**	**Mon 3/8/21**	**15**	**120**	**1,920.00**					
11.1	Install wooden framing on floor slab	MC	Thu 2/18/21	Thu 2/18/21	1	8	120.00	Thu 2/18/21	Thu 2/18/21	1	8	120.00					
11.2	Install foam panels on concrete slab	IC	Thu 2/18/21	Thu 2/18/21	1	8	240.00	Thu 2/18/21	Thu 2/18/21	1	8	240.00					
11.3	Screed Flooring	MC	Fri 2/19/21	Fri 2/19/21	1	8	120.00	Fri 2/19/21	Fri 2/19/21	1	8	120.00					
11.4	Cure Floor		Mon 2/22/21	Mon 3/1/21	6	48		Mon 2/22/21	Mon 3/1/21	6	48						
11.5	Install wooden framing on wall & Ceiling	MC	Tue 3/2/21	Tue 3/2/21	1	8	240.00	Tue 3/2/21	Tue 3/2/21	1	8	240.00					
11.6	Install Foam panels on wall & Ceiling	IC	Wed 3/3/21	Wed 3/3/21	1	8	240.00	Wed 3/3/21	Wed 3/3/21	1	8	240.00					
11.7	Install Drainage & Vent	IC	Thu 3/4/21	Thu 3/4/21	1	8	240.00	Thu 3/4/21	Thu 3/4/21	1	8	240.00					
11.	Install Metal Sheeting	IC	Fri 3/5/21	Fri 3/5/21	1	8		Fri 3/5/21	Fri 3/5/21	1	8						

8							240.00					240.00					
11.9	Install Temperature control & Cold Door	IC	Fri 3/5/21	Fri 3/5/21	1	8	240.00	Fri 3/5/21	Fri 3/5/21	1	8	240.00					
11.1	Inspection & Testing	IC	Mon 3/8/21	Mon 3/8/21	1	8	240.00	Mon 3/8/21	Mon 3/8/21	1	8	240.00					
12	**Building Finishes**		**Mon 3/8/21**	**Fri 3/26/21**	**16**	128	2,400.00	**Mon 3/8/21**	**Fri 3/26/21**	**16**	**128**	**2,400.00**					
12.1	Plaster walls	MC	Mon 3/8/21	Fri 3/12/21	5	40	600.00	Mon 3/8/21	Fri 3/12/21	5	40	600.00					
12.2	Paint walls and woodwork	P	Mon 3/15/21	Wed 3/17/21	3	24	360.00	Mon 3/15/21	Wed 3/17/21	3	24	360.00					
12.3	Install conduit at ceiling plenum space	EC	Fri 3/19/21	Mon 3/22/21	2	16	560.00	Fri 3/19/21	Mon 3/22/21	2	16	560.00					
12.4	Install sinks [industrial & bathroom] & Hardware/accessories	P	Fri 3/19/2021	Fri 3/19/2021	1	8	280.00	Fri 3/19/2021	Fri 3/19/2021	1	8	280.00					
12.5	Pave, curb, and stripe parking lot	MC	Mon 3/22, 2021	Fri 3/26/2021	5	40	600.00	Mon 3/22, 2021	Fri 3/26/2021	5	40	600.00					
13	**Plumbing**		**Mon 3/29/21**	**Mon 4/12/21**	**10**	80	1,520.00	**Mon 3/29/21**	**Mon 4/12/21**	**10**	**80**	**1,520.00**					
13.1	Rough-in plumbing in walls	P	Mon 3/29/21	Fri 4/2/21	5	40	600.00	Mon 3/29/21	Fri 4/2/21	5	40	600.00					
13.2	Sitting external waste pipes	P	Tue 4/6/21	Thu 4/8/21	3	24	360.00	Tue 4/6/21	Thu 4/8/21	3	24	360.00					
13.3	Set plumbing fixtures and trim	P	Fri 4/9/21	Fri 4/9/21	1	8	280.00	Fri 4/9/21	Fri 4/9/21	1	8	280.00					
13.4	Flush, test, and clean piping and fixtures	P	Mon 4/12/21	Mon 4/12/21	1	8	280.00	Mon 4/12/21	Mon 4/12/21	1	8	280.00					
14	**Electrical**		**Wed 7/8/20**	**Thu 3/25/21**	**4**	**32**	**1,120.00**	**Wed 7/8/20**	**Thu 3/25/21**	**4**	**32**	1,120.00					
14.1	Rough-in electrical in masonry walls	EC	Wed 7/8/20	Wed 7/8/20	1	8	280.00	Wed 7/8/20	Wed 7/8/20	1	8	280.00					

14.2	Pull wire in conduit and set area transformers	EC	Tue 3/23/21	Tue 3/23/21	1	8	280.00	Tue 3/23/21	Tue 3/23/21	1	8	280.00					
14.3	Install and terminate electrical devices	EC	Wed 3/24/21	Wed 3/24/21	1	8	280.00	Wed 3/24/21	Wed 3/24/21	1	8	280.00					
14.4	Install light fixtures - test and clean	EC	Thu 3/25/21	Thu 3/25/21	1	8	280.00	Thu 3/25/21	Thu 3/25/21	1	8	280.00					

RESOURCE BASELINE COST																	
WBS	Task Name	-	Start	Finish	Duration	-	Cost	Baseline Start	Baseline Finish	Baseline Duration	Baseline Work	Baseline Cost	Start Variance	Finish Variance	Duration Variance	Work Variance	Cost Variance
15	**Solar Installation**		**Fri 3/26/21**	**Fri 4/2/21**	**6**	48	**1,920.00**	**Fri 3/26/21**	**Fri 4/2/21**	**6**	**48**	**1,920.00**					
15.1	Racking & Mounting Equipment	PV.C	Fri 3/26/21	Mon 3/29/21	2	16	640.00	Fri 3/26/21	Mon 3/29/21	2	16	640.00					
15.2	Solar Panel Install	PV.C	Tue 3/30/21	Tue 3/30/21	1	8	320.00	Tue 3/30/21	Tue 3/30/21	1	8	320.00					
15.3	Install micro-inverters, Electrical system, Enphase monitor	PV.C	Wed 3/31/21	Wed 3/31/21	1	8	320.00	Wed 3/31/21	Wed 3/31/21	1	8	320.00					
15.4	System Testing & Inspection	PV.C	Thu 4/1/21	Fri 4/2/21	2	16	640.00	Thu 4/1/21	Fri 4/2/21	2	16	640.00					
16	**Final Clean-up and Occupancy**		**Tue 4/13/21**	**Mon 4/19/21**	**5**	56	**1,392.00**	**Tue 4/13/21**	**Mon 4/19/21**	**5**	**40**	**1,392.00**					
16.1	Remove debris from building and do final clean-up	GC, LC,SGC	Tue 4/13/21	Fri 4/16/21	4	32	792.00	Tue 4/13/21	Fri 4/16/21	4	32	792.00					
16.2	Substantial completion date	GC, LC,SGC	Mon 4/19/21	Mon 4/19/21	1	24	600.00	Mon 4/19/21	Mon 4/19/21	1	24	600.00					
17	**Complete Final Inspections**		**Mon 4/19/21**	**Fri 4/24/2021**	**6**	48	**600.00**	**Mon 4/19/21**	**Fri 4/24/2021**	**6**							
17.1	Complete punch list items from all inspections	PM	Mon 4/19/21	Tues 4/20/21	2	16		Mon 4/19/21	Tues 4/20/21	2	16						
17.2	Obtain certificate of occupancy	PM	Wed 4/21/21	Wed 4/22/21	2	16		Wed 4/21/21	Wed 4/22/21	2	16						
17.3	Issue final completion documents including warranties	PM	Thur 4/23/21	Thur 4/23/21	1	8	600.00	Thur 4/23/21	Thur 4/23/21	1	8	600.00					
17.4	Issue final request for payment	PM, AC	Fri 24/4/21	Fri 4/24/21	1	8		Fri 24/4/21	Fri 4/24/21	1	8						
18	Finish		Fri 24/4/21	Fri 4/24/21	0			Fri 24/4/21	Fri 4/24/21								

4.5 SUSTAINABLE PROJECT QUALITY MANAGEMENT PLAN

Strategic quality planning (SQP) is attained when strategic planning and quality planning are merged into one seamless process resulting from the free flow of information between strategic planners and quality planners (Calingo, 1996).

As with every other component quality management is critical determine to the impact of the anticipated outcome. Quality management hinges on a series of elements operating in synergy that is coordinated by the individual or individual assigned the responsivity. This plan seeks to ensure the right skill set is assigned appropriately to tasks, that the processes for monitoring and evaluating are consistent with industry established codes/best practices and that there is a communication system that allows for the flow of critical information to support the desired outcome.

A contractor must have a robust quality management program as it is critical to the overall success of a construction project. Furust, 2015 denotes that an effective program creates a process for clarifying standards and requirements, established means and methods for managing the process, defines responsibilities and accountabilities, and adds another avenue to more effectively manage the supply chain, while it reduces misunderstanding and potential conflict. Further too, the Author articulates that the program effectively facilitates and manages the collection of data, identifies performance discrepancies and nonconforming work, and substantially increases efficiency by reducing defects and punch list work, which aids in. improving the working relationship with the design team and the project owner.

Overall the Quality Management Plan systematically manages quality and enhances the contractor's project delivery, increases productivity, eliminates or reduces waste, and ultimately improves profitability.

PURPOSE

This Construction Quality Assurance/Quality Control Plan (CQA/QCP) provides guidance in attaining and maintaining high quality in the planned Construction of a cold storage facility (the Project) for TM Fishing (client/sponsor) at Fond Baron, Loubiere

(site). For this initiative the critical components are excavation of the site, erection of the building, outfitting of cold storage room to industry specifications and installation of renewable energy equipment. It is felt that efficiency in execution of this plan will communicate the high probability that the Project is completed in as per the stipulated and agreed upon terms of the contract. This plan will be used in conjunction the overall project document and other critical specifications.

SCOPE

The composition of the plan includes quality Assurance and quality control elements that will guide construction work activities to include monitoring and testing procedures & observation methods. The overall requirements for inspection and quality assurance, outlined in this Quality Management Plan are the responsibility of the Project Manager /Main Contractor. Construction Quality Control requirements are the responsibility of the Construction Contractor

LIMITATIONS

This plan focuses on primarily on the construction of the facility as a marker of success; the most critical elements to the success of the Project, include removal of top soil and other soil material from excavation process, efficient waste disposal of material substances produced during the construction phase, adherence to sustainable protocols with regards to energy consumption and use environmentally sound material that can withstand the pressures of climate change relevant to Dominica. All elements of the project will be inspected for compliance with specifications set out by the Planning Division by the Prime Contractor. Some elements represent routine types of civil engineering construction (access roads, drainage ditches, etc.) and require no special QA or QC provisions other than those described in the Project Plans and Specifications. The testing frequencies listed herein should be considered a minimum.

The information below communicates the responsibilities and authorities required to support effective construction

RESPONSIBILITY AND AUTHORITY

Functional roles for this Plan are divided among TM Fishing, the Project Manager, The General/Prime Contractor and the Site Manager. A summary of the associated project responsibilities and authorities is presented in Table14 below

CONSTRUCTION QUALITY ASSURANCE FUNCTIONAL ORGANIZATION

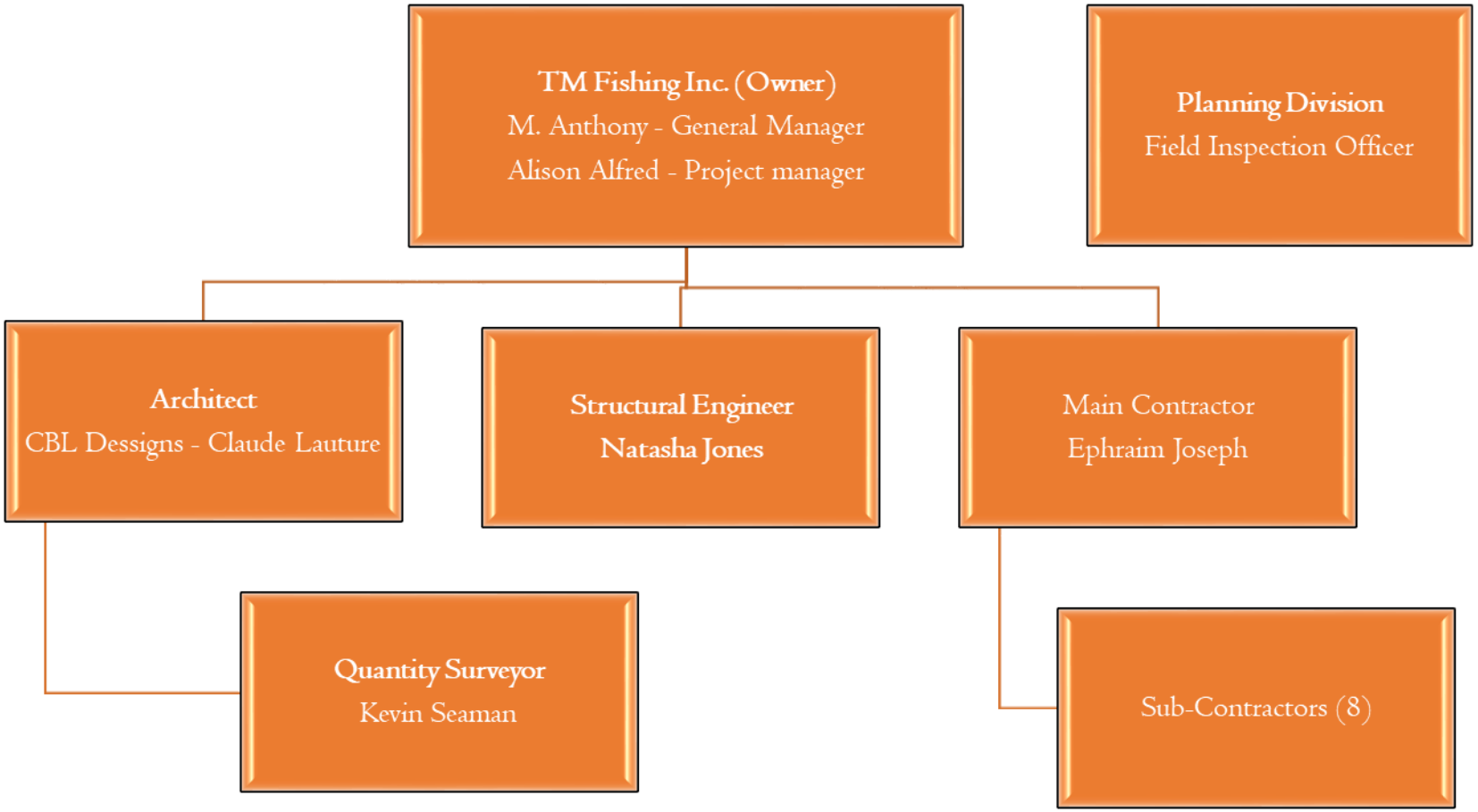


Chart 4: Quality Assurance Structure (Compiled by Author)

REGULATORY AGENCIES

The Physical Planning Division (PPD) is the executing arm of the Planning Authority. Headed by the Chief Physical Planner, the PPD is responsible for administration and operation of the system of Planning for which the Act provides. It is also the point of contact of the Planning Authority with the Public Service and Government.
Functional roles of the EPA during on-Site repository implementation are described in Table 14.

PROJECT OWNER

TM Fishing Inc. is the Owner of the Site and is responsible for the control and implementation of the site activities. Functional roles of the Multistate Trust are further defined in Table 14.

PROJECT MANAGER

The project Manager's primary role is to represent the interest of the client. This requires the Project manager to provide technical and financial oversight for the overall project but in particular, the quality management plan. The PM is tasked with outlining quality requirements, conduct and assess performance reviews for contractors, designate responsibility to project team inclusive

- adopting and applying appropriate technical and quality strategies and standards
- applying change control and configuration management processes
- liaison with appointed project assurance representatives to assure the overall direction and integrity of the project
- adopting any delegation and use of project assurance roles within agreed reporting structures

PROJECT DESIGN CONSULTANT

CB Inc. is the designate design engineer/architect for the project. The firm's main engagement occurred during the design phase of the project; as such the firm is duly responsible for providing development of designs, plans, and specifications which

satisfy the vision of the client within the parameters building regulations. A more in-depth view of the functional roles of the Architect during design are addressed in table 14.

MAIN CONTRACTOR

The main contractor is the individual or company assigned the responsibility to action the works necessary to bring the project scope to fruition. The contractor is expected to engage, procure and manage all subcontractors. The e contractor is expected to have in place monitoring mechanisms to ensure that sub-contractors adhere to design/drawing specifications. Develop a system that ensures that each phase of the construction is adequately planned for and executed. Overall the contractor is critical to quality assurance

SITE OVERSEER

The site overseer is a day to day representative of the Project Management team. The responsibility assigned to this representative includes but not limited to:

- Inventory inspection and management to ensure established quality standard are met consistently
- Ensure that materials, tools & equipment are stored effectively and accounted for,
- Collect and present evidence of site audits/reviews performed.

Table 14 Roles and Responsibility: Quality Assurance

REGULATORY AGENCY: PHYSICAL PLANNING DIVISION	**PROJECT OWNER**: TM FISHING	**PROJECT DESIGN CONSULTANT:** CB INC.	**PROJECT MANAGEMENT:**	**MAIN CONTRACTOR**	**FOREMAN**
• Reviews and approves design plans. • Coordinates government agency interaction, as necessary by designation of a project oversight inspector. • Ensures compliance to environmental and public health stipulations.	Controls and effects implementation of works to be done for construction • Assigns work to the Architect and Prime Contractor • Responsible for Site Management Actions. •Obtains approvals needed to accomplish project completion. •Performs verifications to determine completion of work and approves project closeout. •Ensures that all measures have been employed for the protection of public health and environment	• Identifies approvals i.e. Permits etc. needed to support efficient completion of project. • Provides project engineering and designs specifications • Performs necessary design changes during construction. •	• Prepares an Action Work Plan, including all construction plans and specifications, and other design documents • Develops a risk management plan that considers all categories of risk and mechanisms to control them • have ongoing arrangements in place for managing health and safety throughout the construction phase •	• plan, manage, monitor and coordinate the entire construction phase • liaise with the client, project manager and architect for the duration of the project to ensure that all risks are effectively managed • consult and engage with workers about their health, safety and welfare • ensure suitable welfare facilities are provided from the start and maintained throughout the construction phase • check that anyone they appoint has the skills, knowledge, experience and, where relevant, the organizational capability to carry out their work safely • take steps to prevent unauthorized access to the site • Supply acquisition and management • Keeping the project within budget • Ensuring site safety	• Overseeing quality of work and monitoring progress • Inventory inspection and management to ensure established quality standard are met consistentl y • Ensure that materials, tools & equipment are stored effectively and accounted for, • Collect and present evidence to support site audits/revie ws.

QUALITY ASSURANCE PLANNING APPROACH/METHODOLOGY

Thus cold storage facility is a novel undertaking for the company and it is anticipated that there are significant pros and cons to exploring this venture. The quality of the construction is directly linked to the growth potential of TM Fishing resultant of the quality of service/product offered. This hinges on an overall culture of quality adopted successfully by all partners Table 16 below.

In order to satisfy the project scope with the highest quality output, the requirements set forth by the client will be properly assessed and catered to. Additionally, efficient control mechanism to include accepted building codes as communicated by the Physical Planning Division will be adhered to during all phases of construction.

Further too, the project team has identified the following key protocols which require complete compliance in order to ensure the highest quality service /product is given:

- Each subcontractor prior to the commencement of their phase of work will submit a document outlining the method to be employed for works done. This will communicate among other things: a work schedule, associated risks, defined milestones, detailed description of tools and equipment required with an indication of usage timeline.
- The Project team in collaboration with the General Contractor shall conduct period meetings to review statement of works presented by each contractor to ensure compliance with predetermined codes and instructions. Where and when necessary recommendations etc. will be provided by the team and if necessary change request application will be presented for consideration
- Upon acceptance of the statement of works by the project team, the document will be endorsed with signature by all the relevant persons to include the project manager and the General contractor.
- All materials delivered to the site will be inspected by the Site Manager/Foreman; acceptance criteria stipulated that damaged goods are to be rejected. A log of all acceptable material must be dated and endorsed said authority. Additionally, all

logged materials/equipment will be stored in the designated location in accordance with all security protocol.

- Where each sub-contractual obligation is satisfied, the General contractor shall be notified and an inspection shall ensue. This review will cover:
    a) Evaluation of each phase performance against the define target outcomes
    b) A review of the processes used to produce the outcomes
- Following completion of the overall project and after internal inspection confirms acceptance, an application will be made to the Physical Planning Division for inspection.
- In the eventuality that local authority inspections are unsuccessful and based on subsequent recommendations a change request will be filed. This request supported by clear justification and impact assessment must be issued in writing and endorsed by all relevant parties.

Release of project/product will be preceded by a certificate of compliance awarded by the Physical Planning Division.

Table 15 Quality Assurance Approach Table (Compiled by Author)

	QUALITY APPROACH	SPECIFICATION REQUIREMENT	QUALITY CONTROL	FREQUENCY	RESPONSIBLE PERSONNEL
MATERIALS					
Cement	DMA & OECS accepted building codes	Approved drawings and quantity survey document	Inspection by General Contractor and Site Manager	As per the Contactor's Method Statement, Material supply schedule and Project Schedule	Subcontractors, Main Contractor, Risk Manager, Project Manager
Lumber	Same as above	Same as above	Same as above	Same as above	
Water	Same as above	Same as above	Same as above	Same as above	
Steel	Same as above	Same as above	Same as above	Same as above	
Pour Concrete	Same as above	Same as above	Same as above	Same as above	
Concrete Blocks	Same as above	Same as above	Same as above	Same as above	
Equipment/Machinery	Same as above	Same as above	Same as above	Same as above	
WORKS					
Setting Out			Architect/Engineer	As per the Contactor's Method Statement, Material supply schedule and Project Schedule OR as the need arises determined by internal or external inspectors	Subcontractors, Main Contractor, Risk Manager, Project Manager, Physical Planning Inspector
Roofing	Same as above	Same as above	Same as above	Same as above	
Electrical	Same as above	Same as above	Same as above	Same as above	
PVC Installation	Same as above	Same as above	Same as above	Same as above	
Refrigeration Installation	Same as above	Same as above	Same as above	Same as above	
Plumbing	Same as above	Same as above	Same as above	Same as above	
Sidings & Reinforcement	Same as above	Same as above	Same as above	Same as above	
Excavation	Same as above	Same as above	Same as above	Same as above	
Foundation	Same as above	Same as above	Same as above	Same as above	
Finishing; Casting etc.	Same as above	Same as above	Same as above	Same as above	

After multiple natural disasters that have caused significant structural damage to the built environment the Physical Planning Dept. in has been given the mandate to revise the existing planning guidelines. A number of new considerations have to be factored. The building codes of Dominica are highly influenced by the regionally accepted codes and guidelines. The Organization of Eastern Caribbean States have documented such guidelines and the list below highlight areas covered therein

- Section 1 - Administration of the code
- Section 2 - Definitions
- Section 3 - General Requirements
- Section 4 - Materials and Construction Standards
- Section 5 - Public Health and Safety
- Section 6 - Precautions during Building Construction
- Section 7 - Water Supply Services
- Section 8 - Sewage and Waste Disposal
- Section 9 - Plumbing
- Section 10 - Solid Waste Disposal
- Section 11 - Electrical and Mechanical Installation
- Section 12 - Loads
- Section 13 - Excavations and Foundations
- Section 14 - Timber Construction
- Section 15 - Concrete Block and Masonry Construction
- Section 16 - Plain and Reinforced Concrete
- Section 17 - Structural Steel
- Section 18 - Small Buildings

CONSTRUCTION PUNCH LIST

Project: _____ From (A/E): _____

_____ Site Visit Date: _____

To (Contractor): _____ A/E Project Number: _____

_____ Contract For: _____

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Item Number	Room Number	Location (Area)	Description	Correction/Completion Date	Verification A/E Check

☐ Attachments

Signed by: Date:

Copies: ☐ Owner ☐ Consultants ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ File

Figure 5: Construction Punch List (Source: Construction Specification Institute)

QUALITY CONTROL (QC)

The quality of output in construction is one of the more indicative markers for overall success. It is there for important that the Quality Management Plan designed for implementation is robust and all encompassing. To this end then, the QA approach has to be supported by a series of QC mechanisms to be used by the project team or those given responsibility. To ensure that the quality management plan is successfully implemented the QA approach will be supported by a series of QC tools. Below are examples QC tools for this purpose

Table 16: Quality Control Report (Source: MSDGC, 2014)

CONTRACTOR'S QUALITY CONTROL REPORT (CQCR) WEEKLY LOG OF CONSTRUCTION	DATE
PROJECT NAME:	CONTRACT NO.
CONTRACTOR	WEATHER DETAILS: RECORDINGS: PROJECT IMPACT:
QC NARRATIVES: ACTIVITIES IN PROGRESS MATERIALS DELIVERED GENERAL COMMENTS PREP MEETING INITIAL INSPECTION SAFETY INSPECTION/SAFETY MEETING	
ACTIVITY START-FINISH The following activity commenced this week: Activity No Description No of activities completed this week	
QC REQUIREMENTS	
QC DEFICIENCIES	

Table 17: Initial Inspection Checklist (Source: (MSDGC, 2014)

INITIAL INSPECTION CHECKLIST			
PROJECT NAME:			PROJECT NUMBER:
DFOW:			
DATE:	SHEET:	SPEC. SECTION:	PAGE: ___ OF ___

No.	Item	Yes	No	N/A
1	Was the production foreman present?			
2	Material			
a)	Were materials inspected for compliance?			
b)	Were corrective actions taken for defective material?			
c)	Were corrective actions appropriate?			
d)	Were any deviations accepted?			
3	Installation Requirements			
a)	Did work comply with specifications or plans?			
b)	Was workmanship satisfactory?			
c)	Were corrective actions appropriate?			
d)	Were any deviations accepted?			
4	Tests			
a)	Were tests being performed?			
b)	Was testing frequency satisfactory?			
c)	Were test samples or locations appropriate?			
d)	Was testing quality coordinated with Mechanical/Electrical			
5	Inspections			
a)	Was inspection done by the QC Inspector in the Prep.			
b)	Was the inspection frequency as established in the Prep.			
c)	Were critical inspections satisfactory?			
d)	Was the inspection satisfactory?			
6	Safety			
a)	Was the safety officer present?			
b)	Were the safety requirements followed?			
c)	Were the safety requirements modified?			
Remarks (explanations required for “No” responses and if deviations were accepted):				

Reported By:	Reviewed By:	Reviewed By:
(Quality Control Inspector)	(Quality Control Manager)	(Quality Assurance Representative)

Table 18: Receiving Material Report (source: MSDGC, 2014)

RECEIVING MATERIAL INSPECTION REPORT			
PROJECT NAME:			PROJECT NUMBER:
DFOW:			
DATE RECEIVED:	ORDER NUMBER:	DATE INSPECTED:	INSPECTED BY:

REF NO.	ITEM DESCRIPTION	QUANTITY	PARTIAL OR FULL?	OKAY OR DAMAGED?	SPECIAL STORAGE?

Remarks (explanations required for partial and damaged material):

4.6 Sustainable Human resource Management

Introduction

The effectiveness of the delivery and completion of the project is reliant on the synergy among the resource s of the project; Human Resource is a critical component to this. Identifying, contracting and assigning the right resources to the right task has to be supported a series of mechanisms or systems, this will include but is not limited to methods of acquisition, protocols and procedures and communication. The consideration of principles of sustainability in the construction industry is one that research has shown is omitted from the overall project scope (Othman, et al, 2012) this is particularly the case in the Caribbean. With advancements in labour laws and governing principles etc. contractors and project managers are making a more concerted effort to improve the efficiency of the industry through the adoption of SD Human related principles.

Guided by this understanding this project seeks to through is HR planning approach to address as much as is possible many of the HR related SD principles.

Acquisition & Termination

Personnel will be contracted on a by need basis. The WBS and schedule will determine how many persons will be engaged and the duration of this engagement.

Qualification/Capabilities

All sub-contractors through proper documentation communicate the skill level of their tea/crew. The responsibility of satisfying crew member training needs is the responsibility of the subcontractor and the individual. Qualifications of crew will be vetted using resumes.

REWARDS

To create an environment of inclusivity and the project team will implement with the support of the main contractor, a recognition/reward system to encourage the adoption of best practices throughout the project implementation. Particularly where efforts are taken to reduce risk, a bonus system and or raffle will be used to reward persons.

PROTOCOLS & PROCEDURES

The acquisition and termination of all personnel engaged under this project will be governed by established local and international protocols. In particular, great care will be taken to ensure that no individual is subject to any form of discrimination and where this has been identified established redress protocols will be implemented.

SAFETY:

It is mandatory at all personnel engaged under this project will under safety training. Further too, the established internal safety protocols must be adhered to by all persons on the project site, where there is no compliance the necessary actions will be taken to mitigate against risk and liability.

GENDER EQUALITY

The construction industry is noted for being gender discriminatory for decades (Amaratunga et al, 2006). Appreciating the importance of setting new trends and creating a new norm within the construction industry in Dominica this project has sought to ensure more female representation as much as is possible in this project. As such the project has a non- discrimination policy that all partners particularly General and Sub-Contractors must comply with.

PROJECT ORGANIZATIONAL STRUCTURE

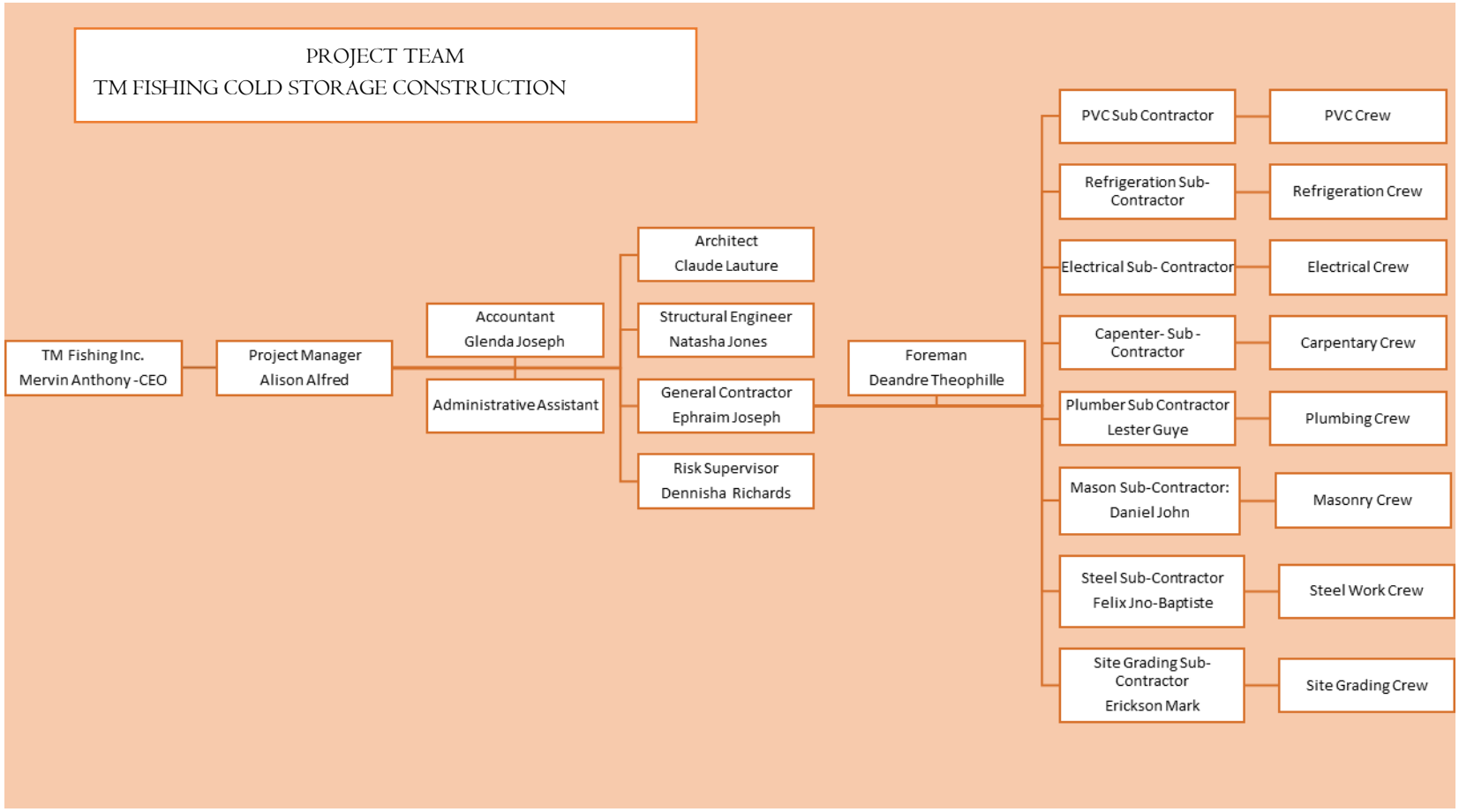


Chart 5: Project Team Organizational Chart (Compiled by Author)

4.7 PROJECT COMMUNICATION MANAGEMENT PLAN

INTRODUCTION

Communication is critical to the successful implementation of any project. Developing a communication plan ensures that among other things, a sustainable network among all key partner is developed and functional. This Communications Management Plan defines the communication requirements for this project and demonstrates clearly how information will be disseminated. The Communications Management Plan defines the following:

- •Communication requirements based on roles
- •What information will be communicated?
- •The Channels for communication
- •The frequency of communication
- •The Sender and;
- •The Recipient

This Communications Management Plan displays a communications framework for this project. It will guide all communications throughout the life of the project and if needed will be amended to reflect approved changes. The plan identifies and defines the roles of persons involved in this project. Additionally, the plan is complimented with a matrix that maps the requirements for this project. Further too, directives for hosting meetings will be shared to ensure that not only are meetings conducted properly but that records so said meets are managed effectively. An in-depth guide for conducting meetings details both the communications rules and how the meetings will be conducted, ensuring successful meetings.

COMMUNICATION MANAGEMENT APPROACH

Given the complexity of managing a construction project the approach take my management must be able to meet the inherent needs and challenges of the situation. As such a proactive approach will be adopted by project management to ensure effective communication on this project. The Communications Matrix presented in this document will give an overview of the projects communication requirements clearly

outlining among other things the purpose of each interaction, who sends and receives the information.

ROLES

The organizational structure clearly communicates some of critical internal roles for the project. The communication plan however will expound on this showing the role of other key stakeholders/partners. As representative of the project sponsor, the Project Manager has overall responsibility for developing and implementing the communication plan. The Project Team will support the Project manager as needed.

Table 19: Communication Plan (Compiled by Author)

COMMUNICATION PLAN								
PROJECT NAME: TM FISHING INC. COLD STORAGE FACILITY CONSTRUCTION								
LEAD PERSON: ALISON ALFRED								
TIMELINE:								
STAKEHOLDER				INFORMATION				
	NAME	POSITION	ROLE	REASON	METHOD	FREQUENCY	DESCRIPTION	RECIPIENT
1	Mervin Anthony	CEO- TM Fishing	Financing	Status update	Email, phone, face	Weekly/ monthly		Project Manager, Loan Officer
2	Patricia Black	Loan officer- AID Bank	Financing	Financial/funding management	Email, Phone	On need basis		Owner/Project Manager
3	Alison Alfred	Project Manager	Oversee Project implementation	Status Update, Coordination , Phase Planning etc.	Email, Telephone, face to Face,	On need basis		Owner, Contractors, Gov. Agencies. Other Stakeholders
4	Claude Lauture	Architect	Design	Planning – design Consultation	Email, Phone, F2F	On need basis		Project Manager Main Contractor
5	Kevin Seaman	Quantity Surveyor	Costing		Email, Phone, F2F	On need basis		Project Manager
6	Glenda Joseph	Accountant	Financial Management	Record keeping, disbursements,	Email, Phone, F2F Email, reports etc.	On need basis		Project manager, Main Contractor, Owner
7	Ephraim Joseph	Main Contractor	Oversee project Works	Coordinate sub-contractors, status reports, quality control, procurement	Email, Phone, F2F	On need basis		P.M, Accountant, sub-contractor

COMMUNICATION PLAN								
PROJECT NAME: TM FISHING COLD STORAGE FACILITY CONSTRUCTION								
LEAD PERSON: ALISON ALFRED								
TIMELINE:								
STAKEHOLDER				INFORMATION				
	NAME	POSITION	ROLE	REASON	METHOD	FREQUENCY	DESCRIPTION	RECIPIENT
8	Daniel John	Sub-Contractor	Mason	Works Related	F2F, Phone	On need basis		Main Contractor
9	Sue- Anne Remy (Redi Mix)	Sales Manager	Sales	Works Related	Phone and Email	On need basis		P.M, Main Contractor
10	Dennisha Richards	Sub- Contractor	Carpenter	Works Related	F2F, Phone	On need basis		P.M, Main Contractor
11	Felix Jno-Baptiste	Sub- Contractor	Steel bender	Works Related	F2F, Phone	On need basis		P.M, Main Contractor
12	Luke Perry	Sub- Contractor	Electrical	Works Related	F2F, Phone	On need basis		P.M, Main Contractor
13	Lester Guye	Sub- Contractor	Plumbing	Works Related	F2F, Phone	On need basis		P.M, Main Contractor
14	Andre Pinnard	Sub-Contractor	Solar Specialist	Works Related	F2F, Phone	On need basis		P.M, Main Contractor
15	Erikson Mark	Sub- Contractor	Site Grading	Works Related	F2F, Phone	On need basis		P.M, Main Contractor
16	Leslie Graham	Sub- Contractor	Refrigeration Expert	Works Related	F2F, Phone	On need basis		P.M, Main Contractor
17	Deandra Theophille	Site Manager/Foreman	Oversee daily site activity	Status reports, security	F2F, Phone	Daily		P.M, Main Contractor

COMMUNICATION PLAN								
PROJECT NAME: COLD STORAGE FACILITY CONSTRUCTION								
LEAD PERSON: ALISON ALFRED								
TIMELINE:								
STAKEHOLDER				INFORMATION				
	NAME	POSITION	ROLE	REASON	METHOD	FREQUENCY	DESCRIPTION	RECIPIENT
18	Ellianna Grey	Risk Supervisor	Risk management	Monitor risks	Email, Telephone, face to Face,	On need basis		P.M, Main Contractor
19	Sherma John	Administrative Asst.	Project Management support	Reporting, filing etc.	Email, Telephone, face to Face,	On need basis		P.M, Main Contractor
20	Joel Harris	Attorney	Legal expert	Contract development /legal advice	Email, Telephone, face to Face,	On need basis		P.M, Main Contractor
21	Fisheries Division		Regulatory	Ensure compliance	Email, Telephone, face to Face,	On need basis		Assigned Fisheries officer
22	Loubiere Village Council		Regulatory	Ensure compliance	Email, Telephone, face to Face,	On need basis		Chairperson/ council members
23	Environmental health Department		Regulatory	Ensure compliance	Email, Telephone, face to Face,	On need basis		Environmental Health District Rep
24	Physical Planning Division		Regulatory	Ensure compliance	Email, Telephone, face to Face,	Monthly/ by Phases		Planning Agent
25	Solid Waste Management Unit		Regulatory	Ensure compliance	Email, Telephone, face to Face,	On need basis		District Agent
26	Natasha Jones	Structural Engineer			Email, Telephone, face to Face,	On need basis		Architect, QS, Project Manager

4.8SUSTAINABLE PROJECT RISK MANAGEMENT PLAN

For the purpose of this assignment, sustainability is defined as the use of solutions, tools and materials in order to reduce long-term risks associated with resource reduction, energy consumption, product liabilities, and pollution and waste management, enabling future development

Risk is inherent to any undertaking that is pursued and thus the development of a risk management plan is critical for identifying, classifying, exploring and mitigating project related risks. The overall value of any risk management system could be qualitatively assessed by its capability to identify and manage relevant risks (Y.G. Raydugin, 2018). This management plan will articulate the agreed upon management approach for risks, inherent and otherwise related to this construction project by equipping the project team with necessary systems to support risk management.

The project management team recognizes that consideration for and adoption of the principles related to sustainable construction and green building are essential to an overall sustainable project. However, these amplify traditional risks associated with construction projects. To ensure that the risk management plan developed and implemented brings forth results the techniques to be employed will be diverse and will include information gathering from key stakeholders (internal and external to the project)., Additionally, as noted by (Iqbal et al., 2015, p. 70-72). these techniques will include but are not limited to brainstorming, checklist, sensitivity analysis, root cause and SWOT analysis. Once the necessary information has been captured the team will compile a risk register. The development of the Risk Register is critical to the collective decision making approach to be taken documented in the Risk Response matrix.

For such inputs, the tools and techniques commonly applied in qualitative risk management are: risk probability and impact assessment, probability and impact matrix, risk data quality assessment, risk categorization, risk urgency assessment, and expert judgment. After applying all the tools of the qualitative risk management approach, the

output is an Updated Risk Register (PMBOK, 2008, p. 289), which can be used further on in a quantitative approach.

ROLES AND RESPONSIBILITIES

The following roles and responsibilities have been identified as critical to ensure that the agreed upon Risk Management processes are actioned in a timely, effective and efficient manner:

PROJECT MANAGER

- Manage relationships with key stakeholders: This speaks to engagement of critical stakeholder within and outside of the project
- Managing and communicating with staff, constructors or sub-contractors
- Managing the project budget and proposed contingencies during the life of the project
- Distribution of resources
- Schedule management

RISK SUPERVISOR

The role and responsibility of the risk manager/supervisor is non-exhaustive, however, the following are some the inherent responsibilities of this role:

- Provide support the Project Manager with contract revision particularly that of subcontractors and vendors in collaboration with legal representative.
- Maintain Risk Register to help to facilitate overall effective decision making
- Conduct meetings with Subcontractors to promote risk identification and populating the Risk Register. Particularly to review contracting policies and to ensure these are in line with the expectation of the client
- Perform continual risk analysis and report the finding to the project manager.
- Identify and implement Risk Mitigation Strategies.

- Devise and implement system to monitor and evaluate a suite of counter risk measures.
- Keep Project Manager up to date with Risk Management strategy implementation. Analyze and understand insurable risks and potential risk mitigation opportunities; interact with operational groups to ensure coordination between project activities, exposures, and appropriate insurance coverage.
- Work with client/owner insurance representatives to ensure proper placement and coordination of any project specific insurance policies.
- Lead communication efforts to ensure that all stakeholders have clarity on the impact of risks particularly negative external risks.
- Manage master Builders Risk program, including reporting and budgetary considerations.
- Analyze and provide appropriate prequalification feedback on subcontractor partners.
- Oversee internal claim management efforts (workers' compensation, general liability, vehicle liability, builder's risk) to include oversight of third party administrators, insurers, and defense attorneys.
- Review and analyze loss control and trending reports, and coordinate with external agencies (particularly the Environmental Health Dept.) to develop appropriate action plans.

RISK CATEGORIES

Having done a thorough analysis, the Project team has identified the following risk categories as relevant to the construction exercise: Environmental Risks, Financial Risk, People, Design, Construction, Project Management, Organizational, and External. The table below communicates not only the identified risks but also the probability of occurrence and level of impact, risk control matrix and Risk Breakdown Structure.

BUDGETARY AND CONTINGENCY DETERMINATION PROTOCOL

Whereas budgetary allocation and risk response are mutually exclusive elements in the scope of project management, the collective impact of both on the overall viability of a

project cannot be understated. In this vain therefore, the project will adopt the following response procedure:

a) Identification of risks per category
b) Perform a Qualitative Analysis
c) Indicate the impact on, costs, schedule and overall quality
d) Using an appropriate either Expected Monetary Value (EMV) an agreed upon model determine the overall impact score of each risk
e) Using a mathematical formula determine the contingency cost per identified risk category (i.e. type and probability ranking).
f) Risk response strategy
g) Assign ownership of risk

RISK CONTROL

Risk control is a critical management tool that ensures that the project team directed by the Risk Supervisor has a clear strategy in place. Every subcontractor prior to commencement of their respective line of work will complete and endorse a risk assessment which must be presented to the person assigned responsibility of risk supervisor. To facilitate effective decision making by the project team, each contract's assessment communicate: the identified risk, the phase or phase likely to be impacted, the level of impact/severity and responses to be adopted. At relevant intervals the risk owner will employ a suite of control mechanisms to include:

- Risk Audits
- Variance Analysis
- Reserve Analysis
- Risk Assessment

Table 20: Risk Register (Source- Compiled by Author)

RISK REGISTER
PROJECT NAME: CONSTRUCTION OF COLD STORAGE FACILITY - TM FISHING INC.
PROJECT MANAGER: ALISON E ALFRED

ID	Category	Risk description	Risk			Without controls			Controls
			H	M	L	Cost impact	Time impact	Other	
1	ENVIRONMENTAL	***Transportation*** Localized transportation to move materials and equipment		Y		Delays in delivery Increase transportation costs Increase no. mans days to address delays in delivery	10-20 days		Mitigate: At least two transportation operators will be reserved
		Energy Consumption		Y		Acquiring permits for running temporary electricity source for construction	10-15 days delay		Accept
		Water: Consumption Availability Displacement	Y			Increased units of consumption Increased cost to source water when there are shortages	15-20 days delay		Mitigate: Erect water storage capacity on property
		Waste: Disposal Recycling	Y			Increase in man hours to address disposal & transportation of waste Additional costs for recycling unusal material accessing location		Loss of reputation if waste management is not properly	Mititigate: Devise with relevant authorities alternative strategies to address
		Bio-diversity: Fauna & Flora		Y					Mitigate
		Changes in environmental regulations	Y				5-10 days delay		Accept
		New qualifying criteria for permits		Y			5-10 days delay		Accept

ID	Category	Risk description	Risk			Without controls			Controls
			H	M	L	Cost impact	Time impact	Other	
2	FINANCIAL RISK	Budget Expansion	Y						
		Contract Related Risk		Y					
		Misappropriation/Fraud							
		Tax/Importation Duties Inflation							
		Restricted Cash flow							
		Changes in regulatory requirements	Y						
		Inflation	Y						
3	HUMAN RESOURCE	Violation of National Labour Standards			Y	lost man days - increase labour cost due to extended work days	10-15 days		Mitigate: Ensure legal/human resource department outlines all national and International labour regulations
		Violation of International Human Rights Protocols: Gender discrimination etc.		Y				Negative impact on reputation: Lack of diversity	
		Challenges with compliance to Ethical Standards			Y				Mitigate: review policies etc. of subcontractors
		Labour Shortages		Y		Loss of Work days- increase labour costs - price spike			Accept
		Poorly written Contracts		Y		Man days - Legal team to revise contracts- increase HR costs			Mitigate: Ensure legal team reviews sub-contractor issued confronts
4	DESIGN RISKS	Incomplete Design		Y					
		Inaccuracies in structural measurements		Y					
		Poorly defined scope (Technical issues)		Y					
		Inconsistencies with preliminary surveys	Y						
		Changes to materials specifications as per Planning Division	Y						
		Design does not meet Planning Standard		Y					
		Incomplete/inconsistent quantity estimates		Y					
		Noncompliance to disability access requirement							

ID	Category	Risk description	Risk			Without controls			Controls
			H	M	L	Cost impact	Time impact	Other	
5	CONSTRUCTION RISK	Failure to accurately estimate duration for subcontracted work		Y		Increase in actual spending over budgeted	Wks delay		Avoid
		Inadequate/low performance tools & equipment		Y		Increase in procurement expenditure	Wks delay		Accept
		Managing change orders		Y		increase in work hours to manage change requests- increase labour cost	Wks delay		Accept
		Damage/theft to materials and equipment	Y			Increase procurement costs	Wks delay		Mitigate
		Unavailability of equipment and tools		Y		Increase procurement costs	Wks delay		Accept:
6	SECURITY	Inadequate mechanisms/systems to reduce/mitigate against intrusion/trespassing	Y			Replacement cost for items damaged or lost etc.	Wks delay		Avoid
7	PROJECT MANAGEMENT RISKS	Poor project management			Y		Man Hrs.Delay		Avoid
		Project purpose definition, needs, objectives, costs, deliverables are poorly defined or understood		Y		Increased design & construction costs	Man Hrs.Delay		Avoid
		Communication breakdown with project team		Y		Implementation		Toxic work environment developed	Mitigate: redefine communication structure/channels
		Lack of coordination		Y		Inefficiency of use of resources: wastage			Mitigate: Ensure mapping controls are in effect.
		Inexperienced workforce	Y			longer man hours require/ high turnover- increase labour costs			

		Procurement		Y					Avoid
		Inability to exercise authority over subcontracted crew .		Y					Mitigate

ID	Category	Risk description	Risk			Without controls			Controls
			H	M	L	Cost impact	Time impact	Other	
8	ORGANIZATIONAL RISKS	Inexperienced staff assigned		Y		Extended timelines- increase in labour costs	avg 10-15 days delay		
		Losing critical staff at crucial points of the project	Y			Extended timelines- increase in labour costs	Wks Delay		Mitigate: Contingency Plan for HR
		Insufficient time to plan		Y			Wks Delay		
		Unanticipated Project manager workload		Y			Wks Delay		Mitigate- delegate responsibilities
		Not enough time to respond to changes deemed necessary		Y		lags in implementation- increase phase costings	Wks Delay	Perception of inefficiency	Accept
		Priorities change on existing program			Y	Increase/decrease in overall project cost	Wks Delay		Accept
		Inconsistent cost, time, scope, and quality objectives (Contractors)	Y				Wks Delay	Perception of inefficiency	Mitigate
9	EXTERNAL RISKS	Opposition posed by municipal authorities		Y		Loss of admin & man days- extension of timelines to accommodate	5-10 days delay	Negative impact on reputation	Mitigate: Pre-construction consultations
		Challenges in obtaining permits etc/ need to obtain additional permits		Y		Loss Man days- extension of timeline to accommodate	5-10 days		Accept
		Shift in priority of project owner			Y	Increase design/construction costs			Accept

RISK BREAKDOWN STRUCTURE

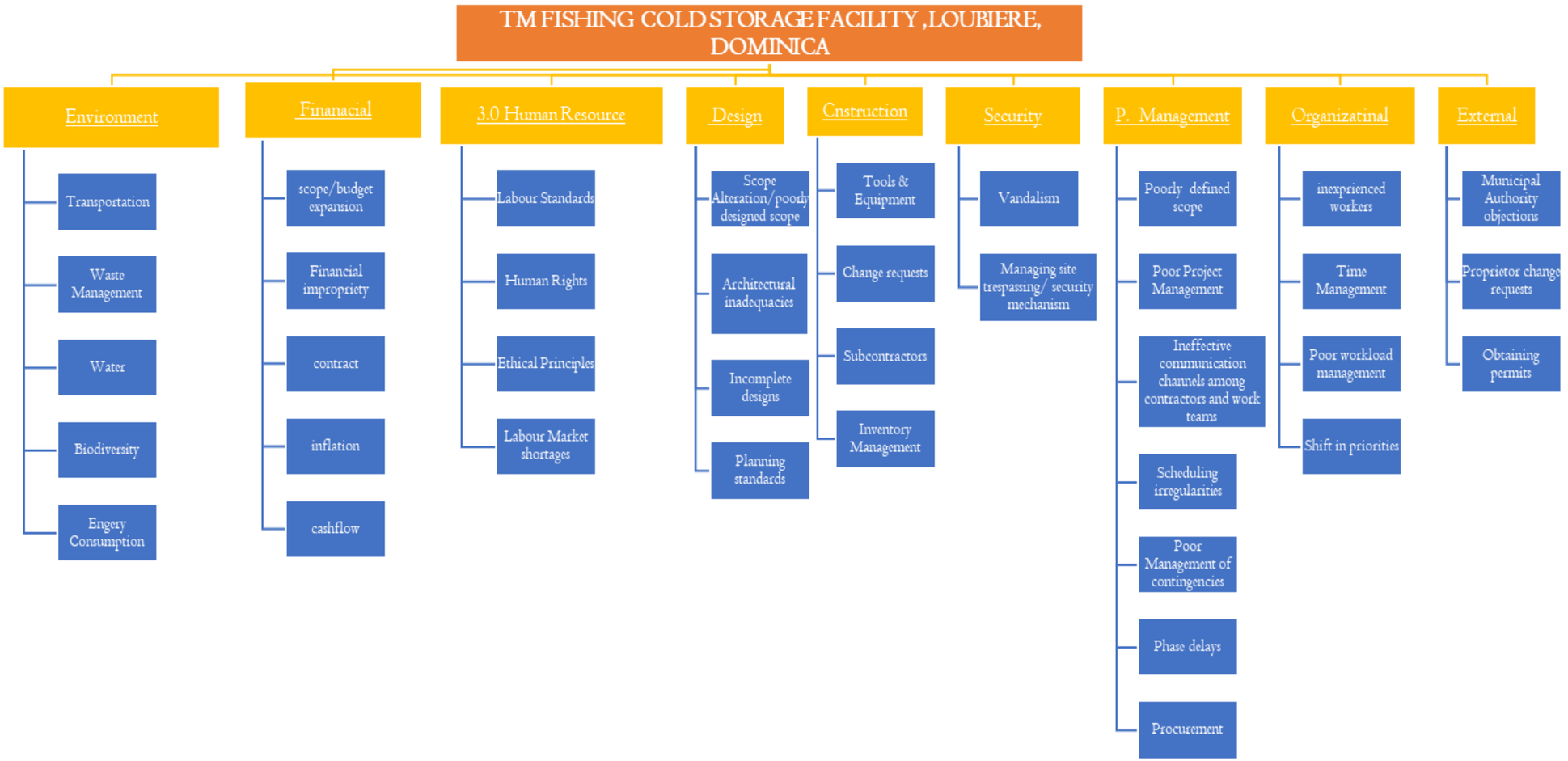


Chart 6: Risk Breakdown Structure (Compiled by Author)

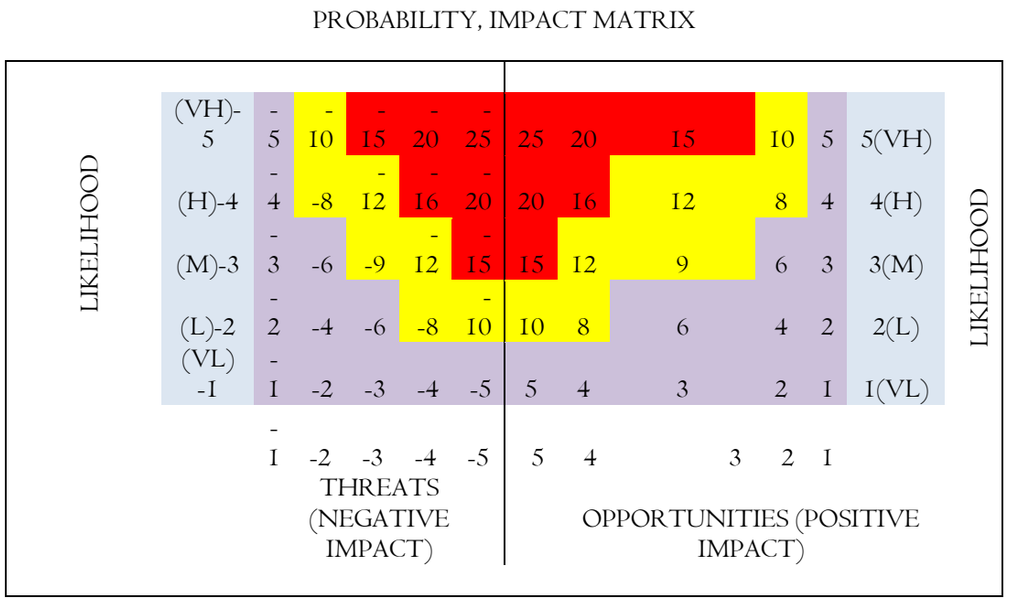


Chart 7: Probability Impact Matrix (Compiled by Author)

Table 21: Risk Severity Matrix (Compiled by Author)

	NEGIBILE	MINOR	MODERATE	MAJOR	EXTREME
SCOPE	Insignificant changes to scope	Minimal scope change	Balance shifting level of scope change	Significant scope changes	Extremely high
TIMELINE	1-2wks setback	2-6wks Setbacks	6-12wks Setback	12-20wks Setback	≥20wks Setback
BUDGET	≤$10,000 xcd				≥$ XCD
QUALITY	Integrity of structure intact	Minimal structural defects			Structure inhabitable
SUSTAINABILITY	All Sustainability objective are met		≥ Sustainability objectives satisfactorily met		No Sustainability objectives have been satisfied.

Table 22: Impact Probability Matrix (Compiled by Author

IMPACT AND PROBABILITY LEVELS					
DESCRIPTION	VALUE	LEVEL	LEVEL	VALUE	DESCRIPTION
≥80% likelihood a significant threat/problem	-5	Very High	Very High	5	≥80% likelihood a significant threat/problem
40-79% likelihood to impact	-4	High	High	4	40-79% likelihood to impact
20-39% Impact likelihood	-3	Medium	Medium	3	20-39% Impact likelihood
10-19% likelihood of impact	-2	Low	Low	2	10-19% likelihood of impact
≤1-9% likelihood of impact	-1	Very Low	Very Low	1	≤1-9% likelihood of impact

4.9 CHANGE MANAGEMENT PLAN

Project changes and/or adjustments are inevitable as they are a fact-of-life at all stages of a project's life cycle. Managing changes effectively is crucial to the success of a construction project (Hao et al, 2008). Change Management is defined as an approach that addresses people-oriented implementation risks arising from change (IRM, 2011). Change management is a necessary and complimentary tool to Risk Management as it is actions the project team's response to an identified risk. The implementation of a change management plan is influenced by time or need. But as per Motawa et al (2007) as a project based industry, change management in construction is influenced by the stages of the construction project life cycle. Table 23 summarizes stages, sources and impacts of construction changes.

Stage	Stakeholder	Types of changes	Impacts	Actions
Specification	Owner/Client/User or architect	Changes to requirements including specification, scope of projects, design brief, etc.	Changes in design and construction processes	Carefully provide detailed specification documents before bidding.
Design	Design/engineering Consultant	Incomplete/inconsistent drawings; design error/defect; design change; omissions of site conditions and buildability; changes in codes and regulations	Rework of design and drawing; rework in construction; change orders	Better control of design versions, drawings; site investigation; consider buildability in design
Construction	Contractor/sub-contractors	As-builts not confirm with as-design; quality defect; unanticipated site conditions; value engineering; materials or equipment not available; inclement weather	Rework; change orders; changes in design	Quality control; site operational control; coordinated documents and drawings; daily logs

Table 23: Summary of Construction Changes (Hao et al., 2008)

PURPOSE

This Change Management Plan Change management seeks to forecast possible changes; identify changes that have already occurred; plan preventive measures; and coordinate changes across the entire project. The Plan addresses more specifically

changes with noticeable impacts, either reworks or change orders, all require following a formal process in change management.

PROCESS

Hao et al. (2008), purports that to be effective, the construction industry needs an integrative solution for a disciplined and coordinated approach to the change management process. This, the authors claim would include documentation, drawing, process, flow, information, cost, schedule and personnel.

This project will adopt as recommended by Hao et al. a five step (see figure) process to include:

1. **IDENTIFY CHANGES:** This stage is supported by an effective internal communication system that to allow for relationships among parties to identify and categorize changes based on new external requirements, symptoms, malfunctions, and various other aspects of changes. Chart 8 shows the integration between different types of change management tools, types of changes and the steps in the response process

2. **EVALUATE AND PROPOSE CHANGES.**: Based on criteria and options, the evaluation module calculates all possible impacts that an identified change can have on other processes and team members, in terms of time and cost. Analysis and (if possible) optimization of change options is required for decision-making – whether to go ahead with any of the change options or to undertake further investigations.

3. **APPROVE CHANGES.** Every potential change identified will go through a formal approval process. The team will apply a set of predefined approval processes for different types of changes and contracts presented for consideration. There will first be an approval by 90% majority of the proposed changed as described in the PCO followed by the client's approval. The Client's approval/rejection is subject to modification to the PCO.

4. **IMPLEMENT CHANGES.** At this stage the designated parties will record all relevant information re each change case. This stage is primarily focused on actioning approved changes as per the documented stipulations. Designated personnel from QC etc. will work collaboratively with those assigned to implement to ensure quality measures are adhered to.

5. **ANALYZE CHANGES.** At this stage the designated parties will conduct a Change analysis and system performance review. All lessons learned will be documented.

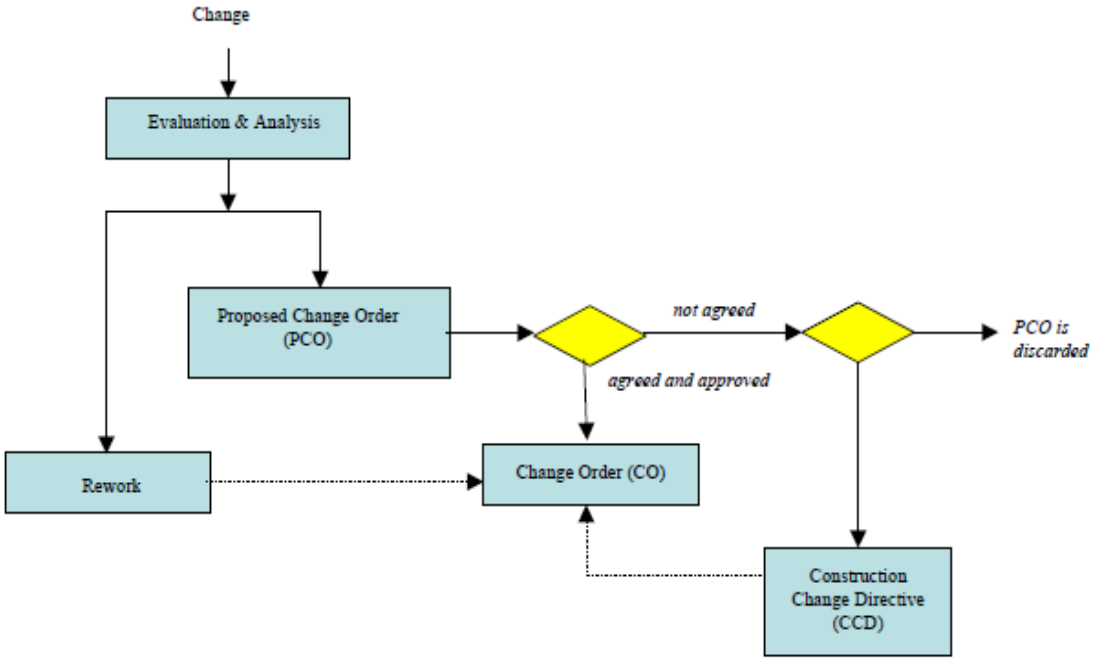


Chart 8: Change orders, reworks, and CCDs (Hao et al, 2008)

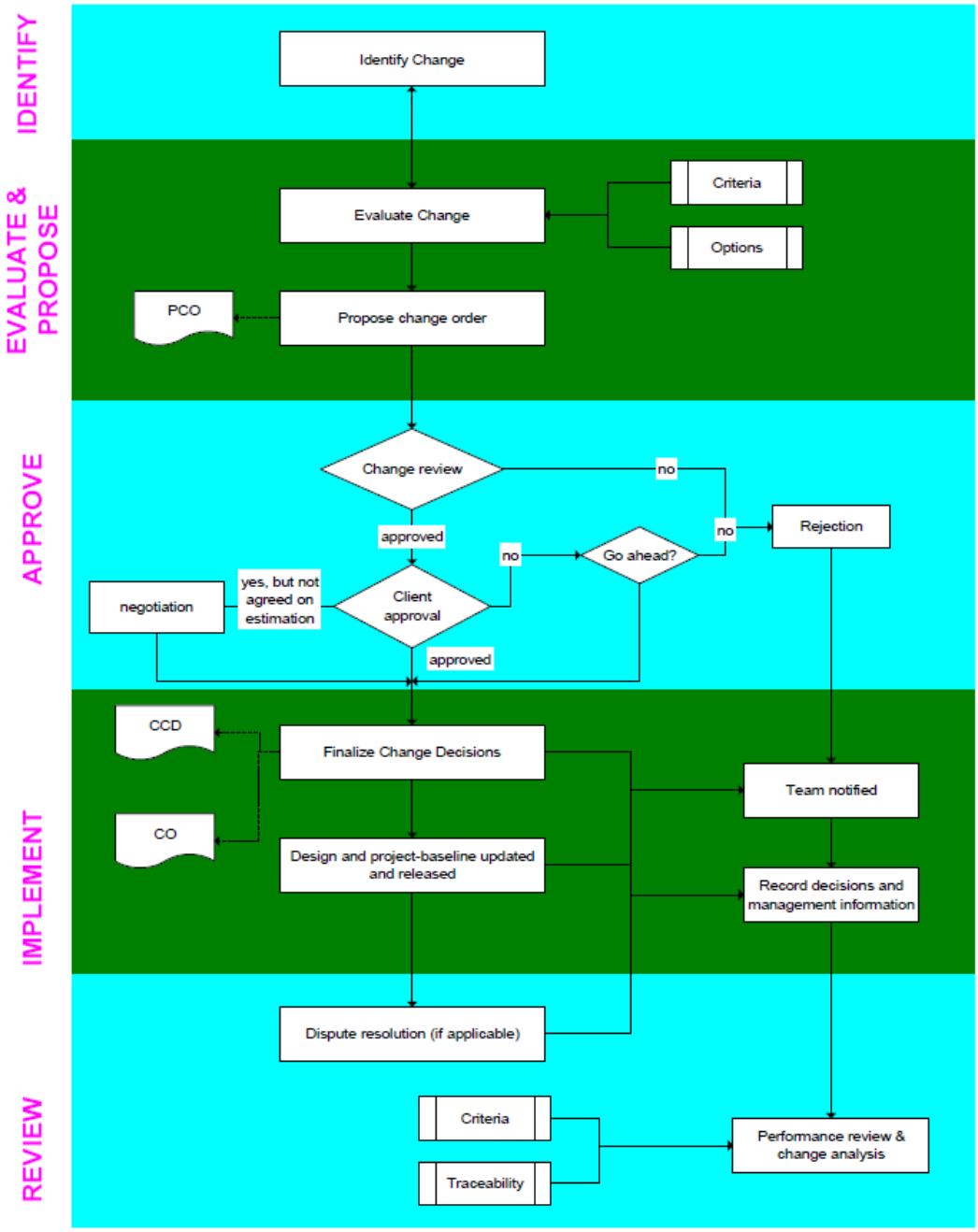


Chart 9: Change process model (Hao et al. 2008)

Table 24: Construction Change Order Form

PROJECT NAME			
LOCATION OF WORK			
PROJECT MANAGER		**CLIENT**	
REQUESTING PARTY		**DATE OF REQUEST**	

CHANGE REQUEST OVERVIEW

DESCRIPTION OF CHANGES NEEDED	
REASON FOR CHANGE	
SUPPORT & JUSTIFICATION DOCUMENTS	*List all attached documents which support the requested change, and justify any increased cost and time.*
SPECIFICATIONS	
ADDITIONAL INFORMATION	

CHANGE IN CONTRACT PRICE

ORIGINAL PRICE	
NET CHANGES OF PREVIOUS CHANGE ORDERS	
NET INCREASE / DECREASE	
TOTAL CONTRACT PRICE WITH APPROVED CHANGES	

CHANGE IN CONTRACT TIMES

ORIGINAL TIMES	
NET CHANGES OF PREVIOUS CHANGE ORDERS IN DAYS	
NET INCREASE / DECREASE	
TOTAL CONTRACT TIME WITH APPROVED CHANGES	

ACCEPTED BY *SIGNATURE*	
NAME & TITLE	
DATE	

APPROVED BY *SIGNATURE*	
NAME & TITLE	
DATE	

4.10 SUSTAINABLE PROJECT PROCUREMENT MANAGEMENT PLAN

PURPOSE

This Procurement Management Plan seeks to outline the strategies to be employed to satisfy both the requirement of the client as well as governing sustainability principles. In this new era of construction, the criteria for this project will depend on operational costs, renewable energy consumption, human resource management, internal and external environmental mechanism/systems quality. There are inherent challenges associated with the realization of sustainable procurement within the Dominican context on the premise of location, procurement costs and availability. Execution of this procurement plan is supported by the Project Manager, Accountant and General Contractor.

ROLES AND RESPONSIBILITY

Given the size of the Project there is no fixed Procurement Office. However, the functions of this position will be satisfied by the Project Manager, supported by the Accountant and the General Contractor. As lead, the project manager will determine the degree of responsibility each of the supporting members. The responsibilities of procurement team as noted by Lewinson (2013) can be classified into two conditional sets – Description and Value. The function of the procurement team requires firstly careful detailing of the goods and services to be procured under the project. The second element relates to compensation to vendors, this is the actual disbursement based on agreed terms

Procurement Approach

Adhering to new building standards that focus of green construction and overall sustainability requires a different and more involve approach to procurement. With regards to engagement of human resources and acquisition of materials etc. will be governed by contractual agreements. The operationalization this project requires decentralization of tasks into two main spheres: internal and external. Internally, the project team as designated will focus on areas from design to construction to not only

identify needs and challenges but to ensure that all decisions supported by procurement are in line with green construction and sustainability. Similarly, the external focus will be on sourcing and acquiring vendors and contractors that satisfy the agreed upon selection criteria.

PROCUREMENT DEFINITION

The project is following a recent trend that sees small enterprises incorporating sustainable building practices and renewable energy in construction. On this premise the project recognizes the cost implication but has made reasonable allocations to support the procurement. Procurement particularly of materials and equipment will meet industry and country stipulated standards from reputable sources. Given the nature of the business, energy efficiency, reliability and conservation is paramount to the client as such investment in energy efficient electrical appliances, particularly the Cold Storage Unit, solar panels with supporting energy storage capacity. Time management is also critical for consideration with the expectation that every phase/task for this project is complement within the specified time frame. Integration of all modules impacting successful procurement and delivery of a quality product is to be managed by the Project Manager.

CONTRACTS

Different transactions will require different contractual arrangements and require the oversight of legal personnel to ensure that all parties are entering a mutually beneficial arrangement. Given the nature of the engagement contracts issued on this project will be fixed priced, time and material contract or Cost plus contracts. Time and Material Contracts will be issued to sub-contractors whereas cost plus contracts will be issued to suppliers.

PROCUREMENT RISK MANAGEMENT

As with every other phase of project management, there are risks inherent to the procurement stage. As with other construction initiative particularly on a small island the challenges with procurement stem from locally available vendors, efficiency of subcontractor work team, international procurement delays and the changes in importation costs and efficient return mechanisms for procurement. Additionally, consideration has to be given to efficiency locally sourced materials etc. An effective risk management plan significantly minimizes the severity of the risk impact; procurement risks management in this project will be management collective by the project manager, risk supervisor and accountant.

COST DETERMINATION

Procurement decision on this project will be supported by a detailed cost benefit analysis that will take into consideration all activity associated costs. Persons supporting procurement will use this tool to create a mapping matrix of all phase specific procurement related costs from inception to completion. Collaboratively the project team will decide reasonable thresholds for respective activities etc.

STANDARDIZED PROCUREMENT DOCUMENTATION

Given that the construction project is being supported in part by lenders, the project has to keep detailed documentation. Additionally, other stakeholders require evidentiary documentation with relation to procurement activities for the project. This will include contracts, invoices, financial statements etc.

DECISION CRITERIA

Every contract that will is issued under this project is done based on specifications unique to the phase or activities the contractee is to perform. As such, the procurement team will devise/use contract specific selection/ decision making criteria for short listing and awarding contracts. One key element particularly with regards to external

procurement is where contracts are awarded based on bidding is evidence of sustainability in proposals. Additionally, time lines, costs, experience etc. are parameters that will inform selection decision.

VENDOR MANAGEMENT

Regulating performance of vendors is critical to the success of the project. As such as part of the procurement management phase the project team has identified several strategies to ensure that parties work within the stipulations of their contract. Otherwise actions in breach of contract will result in financial penalty or in other cases legal action.

Table 25: Procurement Team Roles and Responsibilities (Source by Author)

PROJECT: ACTIVITY		
OWNER	ROLES	RESPONSIBILITY
Alison E Alfred	Project Manager	Plan Purchases and acquisitions Prepare calls for expression of Interest from vendors/contractors Along with other parties develop selection criteria for different categories of procurement: contractors, Vendors etc. Develop a procurement risk matrix identify procurement needs, associated risks and responses Contract Administration
Glenda Joseph	Financial Officer	Manage cash flow Review contracts re financial commitments Manage disbursements Prepare financial statements & Matrices to support Manage tax/duty related procurement costs
Ephraim Joseph	General Contractor	Procurement of approved materials and equipment Validating sub-contractor work performance Manage inventory of materials tools and equipment

Table 26: Procurement Plan Matrix (Source, Construction Procurement Handbook)

SR	ORDER ACCEPT. NO	ACQUISITION ID	ACQUISITION DESCRIPTION	QTY.	RESPONSIBLE PARTY	MONTH WISE PROCUREMENT PLANNING (QTY)												TOTAL BUDGET AMOUNT	TECHNICAL DOC. NO. & REFERENCE DOC. NO.	REMARKS
						JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC			

4.11 SUSTAINABLE STAKEHOLDER MANAGEMENT PLAN

PURPOSE

Sustainability is one of the most important challenges of our time, more so within industries that traditionally did not have this focus. Integration of the concepts of sustainability into project management is an important trend in project management today, particularly with regards to stakeholder partnerships. The success of this integration requires understanding the players and applying the precepts of sustainability to ensure inclusivity, impact-fullness for the advancement of a cause.

Project stakeholder management is often depicted as a set of process that relate to the different project management processes. Silvius & Schipper, (2019) argue that adopting the ethos of sustainability within the project management requires a shift in the understanding and approach to stakeholder relationships. The purpose of the stakeholder management plan is therefore focused on utilizing processes to build relationships with stakeholders that are centered on creating meaningful partnerships as opposed to “managing a resource/element”. Huemann and Zuchi (2014) recommend that the management for stakeholders be interpreted as a source of ideas critical to shaping the landscape of construction.

APPROACH

Recognizing the importance of stakeholder engagement, the project team will adopt what is describe by Bal et al. (2013) as a cyclical perspective (figure 6) to stakeholder management. This model represents the management process as a continuous with interrelated processes that include:

(1) Identify key stakeholders and significant issues;

(2) Analyze and plan;

(3) Strengthen engagement capacities;

(4) Design the process and engage; and

(5) Act, review and report

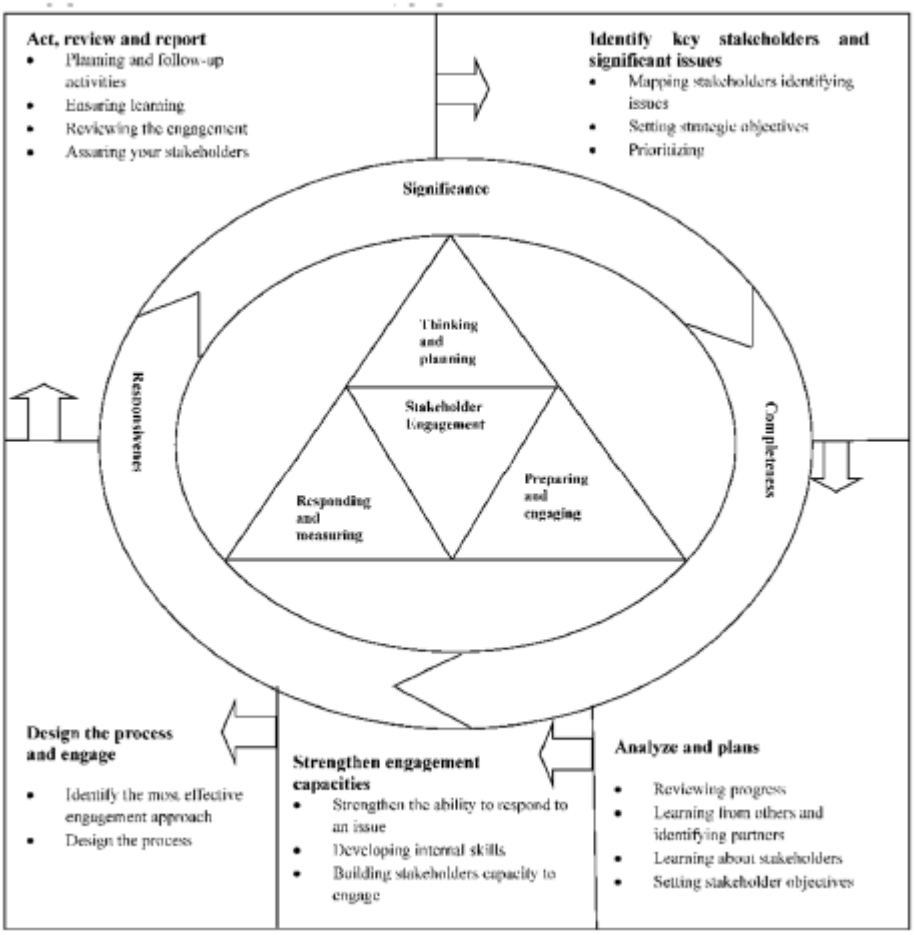


Figure 6:A process model of project stakeholder management (Bal et al. 2013)

Table 25 depicts a compilation of information gathered that satisfy to a large degree the key processes related to the engagement and relationship building plan for stakeholders. Further too, table 26 presents an analytical overview of the power/interest of “key” stakeholders. This information has informed specifically how the project management team will engage/interact with said stakeholders.

INTEGRATION

The project team recognizes the complexity of stakeholder engagement where identification and management of individual expectations and needs are critical. Inherent in this projects stakeholder plan is consideration for risk management. The

power/interest Table 26 has allowed for classification but allows for risk identification ascribed to different stakeholders.

According to Weiss (2003), strategies and tactics developed to scope with stakeholders include:

- Approach each stakeholder directly or indirectly;
- Do nothing, monitor, take offensive or defensive with certain stakeholders;
- Determine whether to accommodate, negotiate, manipulate, resist, avoid or wait, and see with specific stakeholders;
- Combination of strategies

LIMITATIONS

At this juncture the project recognizes its inherent limitations with implementing a holistic stakeholder management plan that is grounded in sustainability. Primarily limitations are resources centred which are likely to impact the manner and timing of responses.

Table 27: Stakeholder Management Plan Matrix (Source by Author)

PROJECT NAME	TM Fishing Cold Storage	BEGIN DATE		VERSION NUMBER	0.0.0
CLIENT	TM Fishing Inc.	END DATE		DATE PREPARED	
POINT OF CONTACT		DURATION		AUTHOR	ALISON ALFRED

STAKEHOLDER MANAGEMENT									
OVERVIEW								CONTACT	
NO	STAKEHOLDER	TITLE / ROLE	INTEREST:	INFLUENCE:	STAKEHOLDER'S MOST IMPORTANT GOAL	CONTRIBUTION	BEST WAY TO ENGAGE	ADDRESS	CONTACT INFO
1	Mervin Anthony	CEO - TM Fishing	I	I	successful construction of a top of the line and efficient storage facility	Financial resources	Reports, Meetings, Site visits	Victoria Street, Loubiere, St. George, Dominica	tmfishing@gmail.com 1-767-617-7181
2	AID Bank	Financier	I	I	That project is completed within stipulated time frame, 2) the facility meets all required standards and 3)That commercial activity can commence to generate revenue	Financial resources	Progress Reports	Charles Street, Goodwill, Roseau, Dominica	1-767-448-2681 aidbank@cwdom.dm
3	Alison Alfred	Project Manager	I	I	To stay on time and on budget; Ensure successful implementation of project management plan	Daily lead; will delegate smaller projects but ultimately responsible	Phone call updates for high-level milestones; weekly email summaries and occasional in-person meetings	Grand Piece Estate, Fond Baron, Loubiere	1-767-285-6348 a,e.alfred@outlook.com

STAKEHOLDER MANAGEMENT									
OVERVIEW								CONTACT	
NO	STAKEHOLDER	TITLE / ROLE	INTEREST:	INFLUENCE:	STAKEHOLDER'S MOST IMPORTANT GOAL	CONTRIBUTION	BEST WAY TO MANAGE	ADDRESS	CONTACT INFO
4	Claude Lautre	Design Engineer	1	1	Budget and timeline; happy constituents	Very little on daily basis, but want to be in the know	Monthly meetings with milestones and budget info	Checkhall, Massacre	cbdesign@gmail.com
5	Kevin Seaman	Quantity Surveyor	3	2	Want to feel in the loop and valued	Very little, but want to be informed if asked by public	General companywide updates along with many other initiatives	Independence Street, Roseau, Dominica	kseaman@gmail.com
6	Glenda Joseph	Accountant	2	2	To protect wildlife, to keep hunting and fishing access, to ensure birds aren't harmed by wind turbines	May discuss in their own publications and to press	Get deep input up front, and agreement on parameters of project and timeline; keep up to speed	Fond Baron, Loubiere, Dominica	1-767-440-0621 gjoseph@gmail.com
7	Ephraim Joseph	General Contractor	1	1	Quality product is delivered to client at end of project	To ensure all subcontractors engaged perform according to stipulations in contract Time and Resource management	Seek input (as above) at beginning and then keep apprised via bill insert or email	Grand Bay, Dominica	1-767-615-8882
8	Daniel John	Sub-Contractor: mason	2	1	completing task in within timeline and at accepted level	Erection of walls and foundation, Block work etc.	site meetings, work performance logs	Grand Bay, Dominica	1-767-613-8882
9	Sue- Anne Remy-Redi-Mix Co,	Pre-mixed concrete	2	1	completing task in within timeline and at accepted level	pouring concrete for roof	site meetings, work performance logs	Soufriere, Dominica	1-767-225-3081
10	Dennisha Richards	Sub-Contractor: Carpentry	2	1	completing task in within timeline and at accepted level	Framing/form work	site meetings, work performance logs	Soufriere, Dominica	1-767-275-6551

STAKEHOLDER MANAGEMENT									
OVERVIEW								CONTACT	
NO	STAKEHOLDER	TITLE / ROLE	INTEREST:	INFLUENCE:	STAKEHOLDER'S MOST IMPORTANT GOAL	CONTRIBUTION	BEST WAY TO MANAGE	ADDRESS	CONTACT INFO
11	Felix Jno-Baptiste	Sub-Contractor: Steel Work	2	1	completing task in within timeline and at accepted level	Steel work	site meetings, work performance logs	Canefield, Dominica	
12	Luke Perry	Sub-Contractor: Electrical	2	1	completing task in within timeline and at accepted level	Electrical Installation as per code requirements	site meetings, work performance logs	Castle Comfort, Dominica	
13	Lester Guye	Sub-Contractor: Plumbing	2	1	completing task in within timeline and at accepted level	Plumbing installation as per code requirement	site meetings, work performance logs	Soufriere, Dominica	
14	Andre Pinnard	Sub-Contractor: PVC Installation	2	1	Cost-effective energy prices; renewable energy sources, but not at expense of environment	consultations with client and project team on best systems to procure, maintenance and sustainability	site meetings, work performance logs	Castle Comfort, Dominica	
15	Erickson Mark	Sub-Contractor : Excavation	3	1	completing task in within timeline and at accepted level	Excavation/site preparatory work	site meetings, work performance logs	Fond Baron, Loubiere	1-767-277-7568
16	Leslie Graham	Sub- Contractor: Cold Storage Installation	3	1	completing task in within timeline and at accepted level	Installation of Refrigerator	site meetings, work performance logs	Bath Estate, St. George	1-767-276-1357
17	DeAndra Theophille	Site Manager/Foreman	2	2	All site related activities are enacted to project specification	Manage and secure site resources oversee activities of crew	site meetings, work performance logs	Soufriere, Dominica	1-767-613-9595
18	Ellianna Grey	Risk Supervisor	1	1	Minimize negative risk through effective responses	Phase and Risk Planning Support Manage Risk Plan	Emails. Phone calls, evaluation meetings etc.	Roseau, Dominica	1-767-277-1537

STAKEHOLDER MANAGEMENT									
OVERVIEW								CONTACT	
NO	STAKEHOLDER	TITLE / ROLE	INTEREST:	INFLUENCE:	STAKEHOLDER'S MOST IMPORTANT GOAL	CONTRIBUTION	BEST WAY TO MANAGE	ADDRESS	CONTACT INFO
19	Sherma John	Administrative Staff	I	3	Support project team in advancing implementation	admin support- document preparation, planning of meetings, phase and risk planning	Emails., Face to Face meetings,	Roseau, Dominica	1-767- 22-4000
20	Joel Harris	Attorney	I	I	To ensure that the client and project management team mitigate against liability	provide legal advice to govern phase implementation contract review	Consultations	Grand Bay, Dominica	jharris@harrisharris@gmail.com
21	Fisheries Division	Fisheries Regulatory Agency: Government	I	I	That facilities(equipment, procedures etc.) for handling food are compliant with standards	Outline industry requirements etc.	Consultations, Status Reports	Soufriere, Dominica	1-767-440-3000
22	Loubiere Village Council	Municipal Regulatory Authority : Local Government	I	2	interest of community is respected	Provide permission for construction.	Private meeting with council	Canefield, Dominica	loubieriervillagecon@gmail.com-617-2124
23	Environmental Health Dept.	Regulatory Agency: Government	I	I	To ensure that the building construction does not produce negative externalities to affect the environment, that the health and safety of community is not impacted. That facilities(equipment, procedures etc.) for handling food are compliant with standards	Ensures that environmental health and safety regulations are maintained Issue permits works or certifications of compliance	consultation, Status Reports	Canefield, Dominica	1-767-671-1000 environhealth@dominica.gov.dm

STAKEHOLDER MANAGEMENT									
OVERVIEW								CONTACT	
NO	STAKEHOLDER	TITLE / ROLE	INTEREST:	INFLUENCE:	STAKEHOLDER'S MOST IMPORTANT GOAL	CONTRIBUTION	BEST WAY TO MANAGE	ADDRESS	CONTACT INFO
24	Physical Planning Division	Regulatory Agency: Government	2	I	To ensure that all constriction activity is in compliance with planning codes and guidelines etc.	Planning Codes and Guidelines	consultation, Status Reports	Roseau, Dominica	
25	Waste Management Authority	Waste and Sewage Management Regulatory Agency: Government	2	3	Proper disposal of waste material	Waste disposal	consultation, Status Reports	Roseau, Dominica	

Power / Interest Grid for Stakeholder Analysis

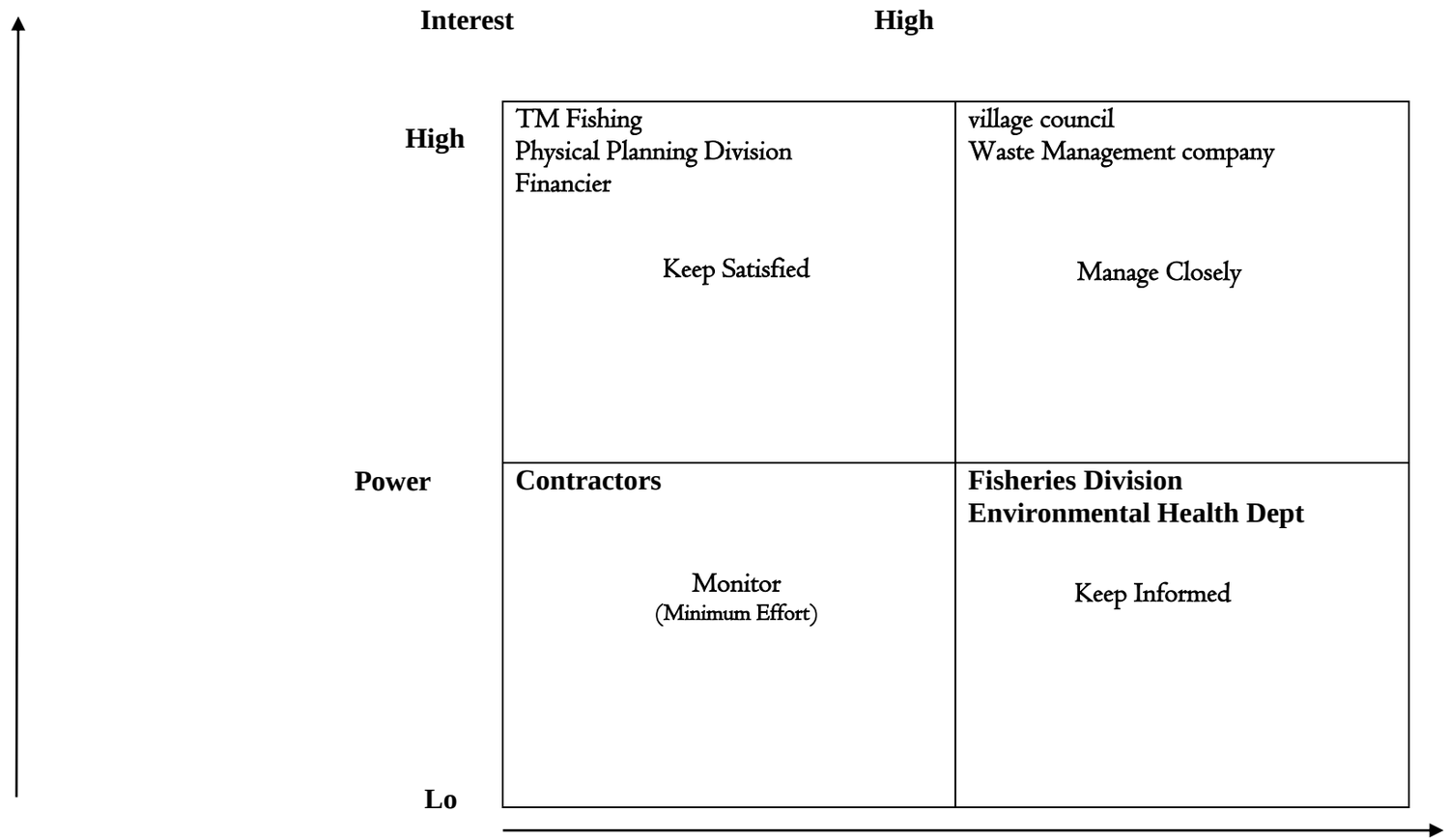


Table 28: Power/Interest Grid(Compiled by Author

CONCLUSION

The construction industry is today faced with a new reality, one that is multidimensional and having cater to the board concept of sustainability. Integration of sustainability into the scope of construction management is complex but in time and financial requirements. The complexity of this integration is further exacerbated in situations where the challenges range from lack of knowledge or acceptance by localized industries, absence Government regulations and standards to support the adoption and to lack of human and other resources to advance to effective integration. The above simply communicates that where a framework to advance integration of sustainability into the construction industry is either non-existent or poorly designed advancement will be compromised.

Sustainability must be factored in at the conception stage of the project, requiring key stakeholder to include owners, architects, engineers, project managers and financiers to develop and administer protocol that ensure sustainability compliance. Project management in construction must commence at the conception phase.

The Cold Storage facility is a novice undertaking for a small company like TM Fishing and as such there is little to no direct example which can be modelled to ensure project success. Irrespective of this the project team was guided by industry best practices and information obtained from relevant local authorities to ensure that the project output satisfied approved standards.

- An effective time management for the construction project is important in managing risk of the delayed completion project. The project has adopted a proactive response to time management as a strategy to mitigate against external influences to scheduling but also to ensure that activities can be undertaken within the specified/agreed upon timeline. The plan as it stands is amendable to take into consideration unforeseeable impacts on scheduling.

- The area of cost management is particularly sensitive to the requirements of Sustainability. This is evidenced by commodity accessibility, cost of materials and specialized labor to install renewable energy systems (Solar) as well as energy efficient fixture- fittings, tools and equipment. Understanding the implications of external market considerations on price, the core persons responsible for procurement will ensure that all risk considerations are catered for. The procurement protocol for the project ensures that in particular external parties comply with sustainability principles; subcontractors in particular will be assessed against this standard.

- Despite being a small project by industry standards, Quality Management is still of paramount importance in the construction of TM Fishing Cold Storage Facility. The Project Team has in place a robust and unique QM approach to ensure effectiveness and efficiency. The QC & QA mechanism to be implemented are critical to ensure mitigation against construction related risks among others. For this project the scope of quality management moved beyond the traditional focus on material and construction processes output but includes Human resource considerations (capability, capacity, knowledge, unique requirements), cost to benefit exchange to the client suppliers, environmental impact, conformity to global trends and Government regulations etc.

- The project's Communication Management Plan does not diverge from the traditional in terms of flow of information. However, it should be appreciated that utilizing a series of communication channels the project eliminates discrimination based on access to technology in some respects. The use of technology minimizes the project's carbon foot print and waste generation due to the minimal use of paper consumption

- The team recognizes the complexity and importance of risk management as it impacts quality, cost and duration of the project. This Risk Management Plan has captured the potential impact on sustainability in critical areas such as the

Environment, Human Resource, and Procurement. It is however, the response/control approaches that the project team uses that speak to the effectiveness of the integration of sustainability.

- Project Management subscribes to an inclusive policy with regards to the engagement of Human Resource. In particular, as evidence by the organizational structure and stakeholder matrix, a concerted effort to ensure equitable gender representation at different levels of the project was paramount. This is against traditional practices in the construction industry but now representative of the shift to comply with international rule of law to minimize discrimination based upon gender, sex, physical limitations etc. Capacity building and safe working environments have also been catered for as well as systems to motivate and encourage better work output. While the project management team would have little influence over Sub-contracted crews, contractual agreements ensure that crews are protected against discrimination and any other form of unjust treatments.

- An effective change management plan is one that is dynamic and integrative. The approach and processes adopted must be reflective of best practices and project at hand. The construction industry needs an integrative solution for a disciplined and coordinated approach to the change management process. A five step process supported by other internal stipulates includes: identification, evaluate and propose changes, approval, implementation and analysis. Documentation is critical to capture and improve upon lessons learned et. Managing change is not without risks to the project baseline particularly cost and time.

- The impact of the integration of sustainability on the development and implementation of the Procurement Management is similar to that of the phases of project management. The project team has been able to utilize industry-established protocol concerning sustainable procurement to inform its

procurement protocol. The established check lists for different classification of vendors/ service providers ensures that the selection process is informed by an agreed upon criteria thus ensuring that all parties involved in the project advance sustainability in the construction industry.

- Finally, the Stakeholder Management Plan was developed to identify, classify and allow for the effective management and interaction with key contributors to project implementation and success. Stakeholder power and influence matrix was populated to identify which key stakeholders had the greater potential to support the integration of sustainability principles.

RECOMMENDATIONS

The information therein pertains to several stakeholders involved in this project but overall the recommendations are relevant to all parties that will shape the construction industry in Dominica.

1. THE GOVERNMENT OF DOMINICA

Accepting sustainability as a core catalyst for development the Government should employ a more dynamic approach to the revision of current building codes and guidelines to take into consideration more modern architectural and building designs. This is critical to mitigate against the implications of negative externalities create from the construction industry. Updated building codes will tie into the development and implementation of Land Use Planning policies, reduce instances of land degradation, protection of natural resources from ridge to reef. Additionally, revision of these code will ensure mitigation against natural disasters such as hurricanes and earthquakes.

2. THE PHYSICAL PLANNING

The Physical Planning Division should be more proactive with efforts to educate a plethora of stakeholders from homeowners, to students, financial institutions to contractors. This recommendation is critical as the Division will have to through education and awareness enhance national buy-in into policy and frameworks that create the foundation for not only sustainability in the construction industry but as well as natural resource management.

3. CERTIFICATION

The construction industry needs to be regulated and monitored. As such It is important that training and certification of construction related personnel be prioritized as conditions for employment. It is therefore important that the Ministry of Education consider revision of national curriculum for tertiary education. Enhanced capacity is critical to the development, efficiency and effectiveness of the industry.

4. THE UNIVERSITY FOR INTERNATIONAL COOPERATION

The UCI in order to make the course more relatable should incorporate more diverse case study modules to support knowledge transfer in more practical way. This would be particularly beneficial for those with no experience in project management.

5. RESEARCH

Construction is particularly in Small Developing Islands (Caribbean) is not an area that is researched. It means that there is little to no location based scientific or historical data to inform advancement of the industry. It is critical therefore that all stakeholders (Government, Natural Resource Management Agencies, The Building Industry, Education sectors etc.) make greater investment into enhancing the capture, analysis and utilization of sound data to inform decision re making the construction industry more aligned with SD Goals in construction within the Caribbean Region Context

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APPENDICES

Appendix 1: FGP Charter

<table>
<tr><th colspan="2">PROJECT CHARTER
(Formalizes the project start and confers the project manager with the authority to assign company resources to the project activities. Benefits: it provides a clear start and well defined project boundaries)</th></tr>
<tr><td>Date:</td><td>Project Name:</td></tr>
<tr><td>March 1st 2020</td><td>Project Management Plan for the Construction of a fish storage facility for the Compnay TM Fishing Inc. in Loubiere, St.George, Commonwealth of Dominica.</td></tr>
<tr><td>Knowledge Areas / PM Processes:</td><td>Application Area (Sector / Activity):</td></tr>
<tr><td>• <u>Knowledge Areas</u>:
• Integration,
• Scope Management,
• time Management,
• Costing Management,
• Human Resource Management,
• Communication Management,
• Risk Management,
• Procurement Management
• Change management
• Stakeholder Management
• Quality Management

<u>PM Processes:</u>
Initiation, Planning, Executing,
Monitoring & Control, Closing</td><td>Construction</td></tr>
<tr><td>Project Start Date:</td><td>Project Finish date:</td></tr>
<tr><td>24th February, 2020</td><td>21st August 2020</td></tr>
<tr><td colspan="2">Project Objectives (General and Specific):</td></tr>
<tr><td colspan="2"><u>General Objective:</u>
To develop a comprehensive project management plan grounded in the ethos of sustainability to ensure efficient use of resources for the construction of cold fish storage facility in Loubiere that adds value to community development.
<u>Specific Objectives:</u>
1. To create a scope management plan that outlines all relevant stakeholders inclusive of their individual requirements and expectations
2. To develop a time management plan that will facilitate the delegation of key tasks / activities that can be monitored and evaluated
3. To create an dynamic and integrative cost management plan that details all cost related components critical to the implementation of the project</td></tr>
</table>

4. To develop a procurement management plan rooted in sustainability and international industry specific best practices
5. To formulate a communication management plan that clearly defines the strategies to be employed for both internal and external exchanges
6. To develop a human resource management plan that will facilitate the engagement of the accurate number of employees required, with matching skill requirements to accomplish organisational goals also ensuring that engagements processes are in tandem with international laws. t
7. To establish a change management plan that will support the management of processes thus ensuring synergies among other all key knowledge areas to minimize the impact of change on the vision of the organization
8. To develop a quality management plan that merges stakeholder acceptance criteria with industry establish quality standards
9. To formulate a stakeholder management plan that identifies, categorizes and analyses the impact of stakeholders on the vision of the initiative.

Project purpose or justification (merit and expected results):

The purpose of this initiative is to through research determine the extent to which a project management plan will improve the management processes of a construction project for the advancement of business operations for TM Fishing. Specifically, the study will examine the feasibility of the initiative based on proposed scheduling and cost as critical factors. TM Fishing is the first enterprise of its kind; that has strategically positioned itself to move away from the traditional operations of small artisanal fishing into a more structured and focused business venture. This was prompted by initial market information translated in high demand for catch that has been cleaned and readily available.

With respect to the above, TM Fishing is disadvantaged in that the enterprise does not have the capacity to develop, implement and monitor a management plan for its proposed construction project. Recognizing its limitation, the company appreciates the need to engage a project management professional that can articulate its vision but also formulate a strategy that will ensure that construction satisfies all established standards for such facilities.
It makes sense to plan its construction activities in such a way that environmentally focused best practices are deliberately integrated into plans for construction of the storage facility. On this premise the following benefits can be expected

1. TM Fishing will adopt a culture of strategic planning for better accountability, cost management and quality control.
2. Resources will be closely managed and tracked.
3. Project will be completed within the planned timeframe.
4. Efficient utilization of finances and human resources.
5. Adoption of the United Nations regulations on human rights.
6. Integration of sustainable actions and decisions that are aligned with its policies on environmental conscientiousness such as energy efficient buildings.
7. Foster an atmosphere that encourages all stakeholders to entrepreneurs that adopt environmentally sustainable practices in their business models.

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

Through this exercise as project manager I expect to produce:

- Develop a Project Management Plan to guide the activities related to the construction of a cold storage facility.

Assumptions:

1) The project can be completed with the seven months allotted and can be done by one Project Manager
2) There is Expert judgment to guide the Project: This an environmental & Structural engineer as well as a PVC specialist
3) Management will be receptive to the recommendations and activities outlined in the project management plan
4) The company will attract adequate employees

Constraints:

The following articulates the constraints that can negatively impact the execution of the project:
1) Cost - potential increase in overall cost due to availability of key resources
2) Resources. The type, amount, and availability of resources to perform your project work.
3) Time. Balancing work and my daily activities with the demand of the project
4) Management/ownership support- limitations in this due to knowledge etc can impact advancement of implementation.

Preliminary Risks:

1) Demands of work commitments that will interrupt time allocated to development of project management plan this may impact the timeframe for delivery and implementation

2) Misrepresentation of vision of TM Fishing, this can cause limitations in the development of project scope, stakeholder identification, costing and scheduling

3) If there are not adequate change management tools considered, this might affect response mechanism thus impacting time, scope, cost and quality

Budget:

Estimated Budget: XCD 250,000.00

Milestones and dates:

Milestone	**Start date**	**End date**
FGP Seminar	24th February,2020	20th March 2020
Tutoring	30th March 2020	26th June 2020
FGP Review	29th June, 2020	17th July 2020
FGP Corrections	20th July 2020	14th August 2020
Presentation to Board of Examiners	17th August 2020	21st August 2020

Relevant historical information:

TM Fishing Inc. is a subsidiary of MJA Enterprises Inc. established in 2018 in the commonwealth of Dominica. The company's drive is to explore and exploit the blue economy opportunities surrounding the ocean. At this time the focus of TM Fishing is artisanal fishing. Since its inception the company has acquired two fishing boats, one mid-size and one small, a 4x4 pick-up truck, used refrigerated truck as substantial assets. The company five directors/owners supported by a Management consultant on an ad hoc basis. The company is located in Loubiere, St. George, Roseau Dominica, at this time there are no permanent employees, fishing crews and cleaners are engaged on a at need basis. The company has experienced noticeable growth both in client base (supplying several supermarkets and restaurants) and well as capital assets. Unfortunately, to date the company has no prior experience in executing the project at hand.

Stakeholders:

(Direct stakeholders:

1)TM Fishing Inc
2)Project Manager: Alison Alfred
3)Fisher Folk
4)Clients(Buyers- individuals, cooperate)
5)Loubiere Community
6)Environment & Structural Engineers
7)PVC Consultant
8)Laborers

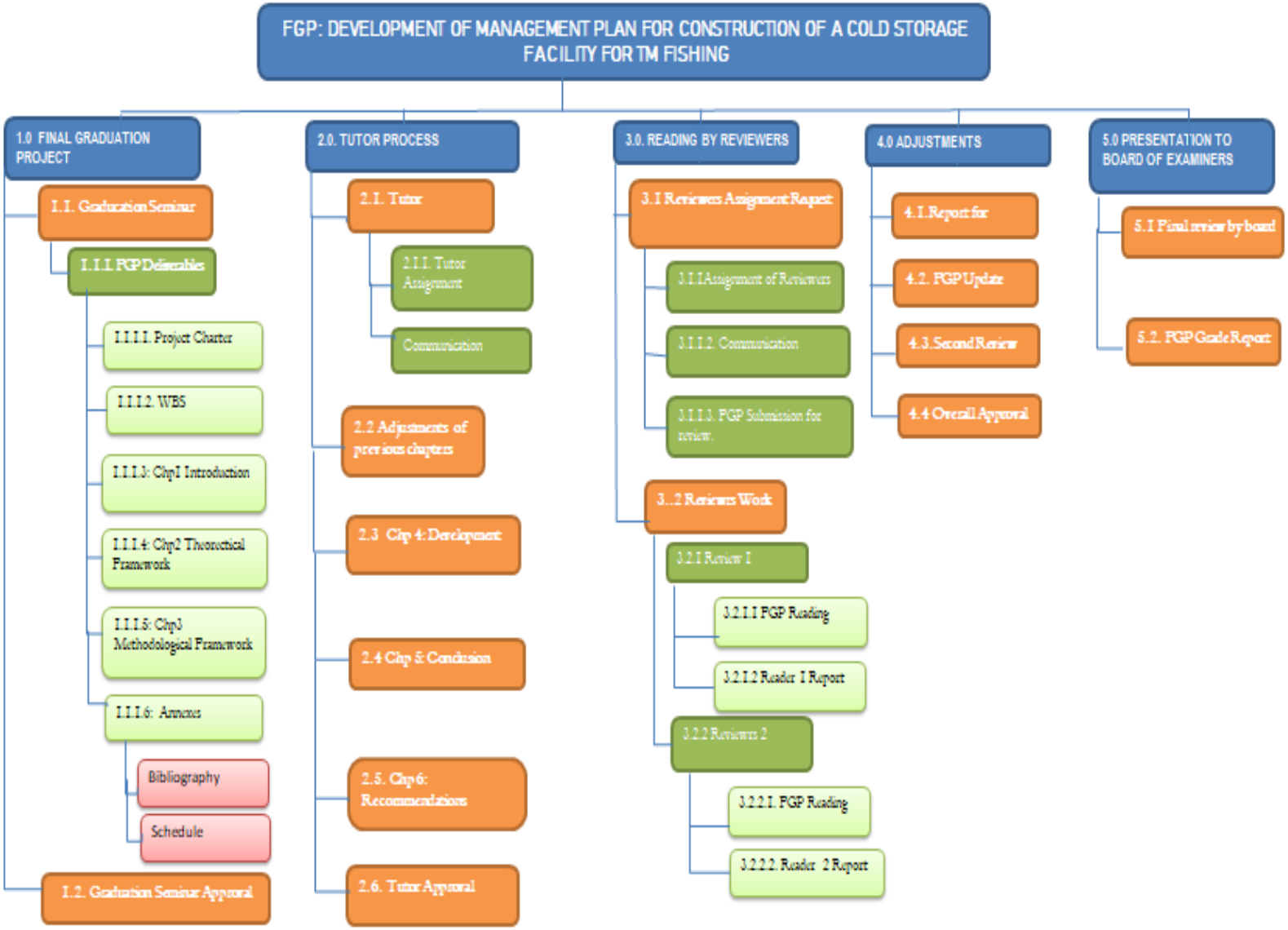
Indirect stakeholders:

1)The Government of Dominica : Ministry of Blue & Green Economy, Agriculture and National Food Security
2) The AID Bank

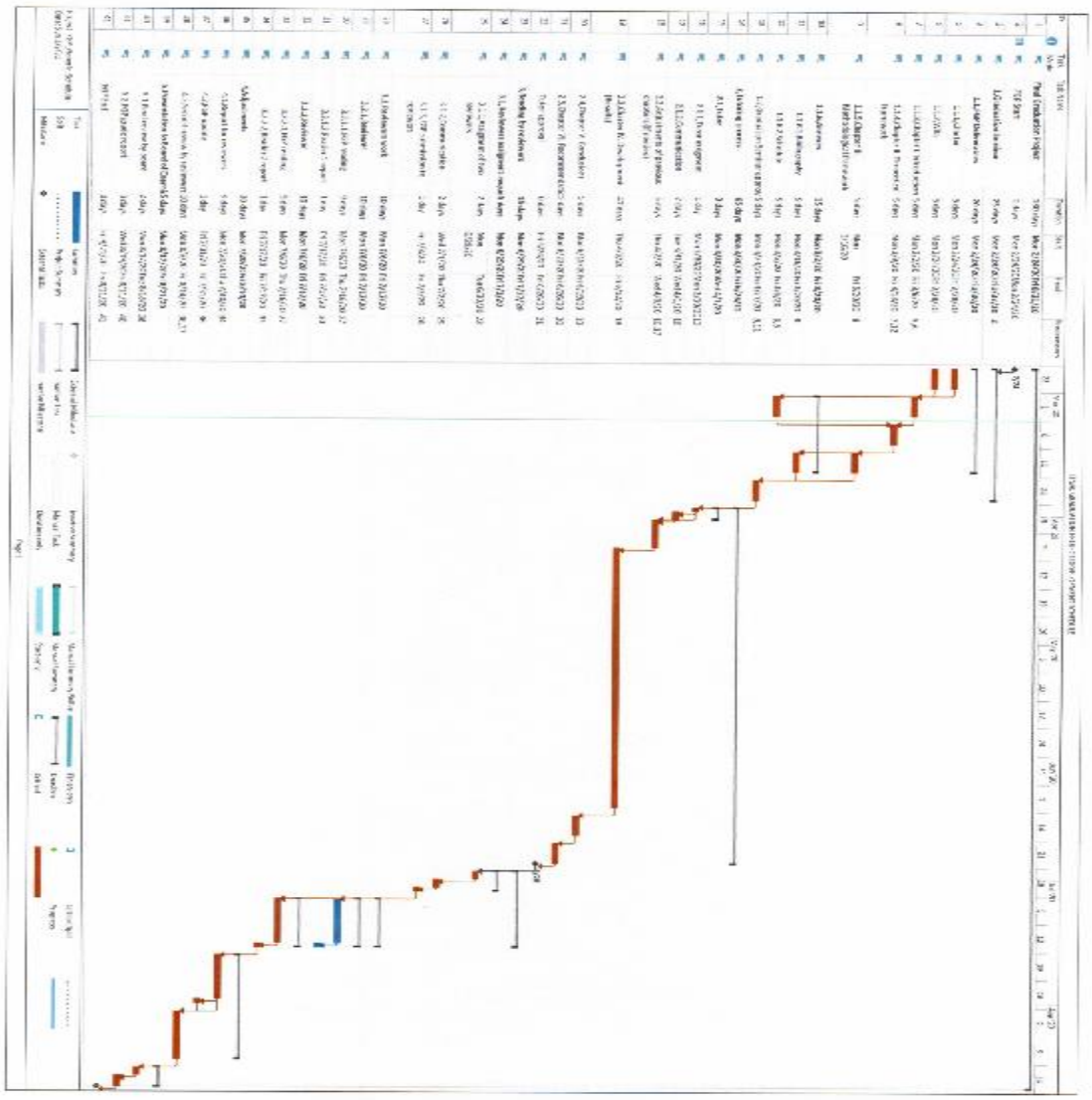
Approval:

Project Manager: Alison E Alfred	Signature:
Authorized by:	Signature:

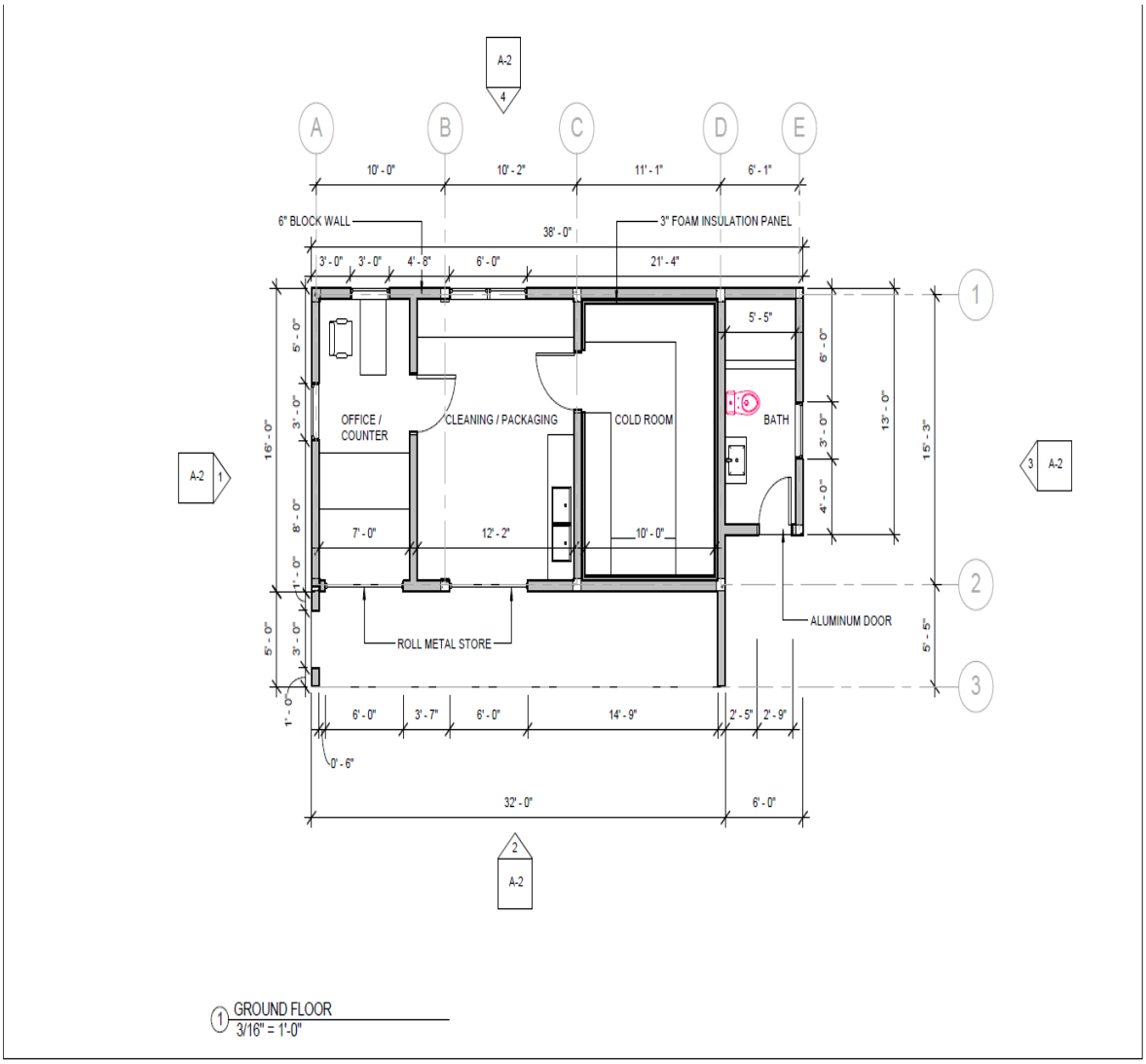
Appendix 2: FGP WBS

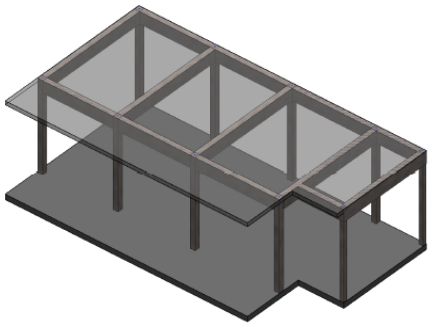


Appendix 3: FGP Schedule

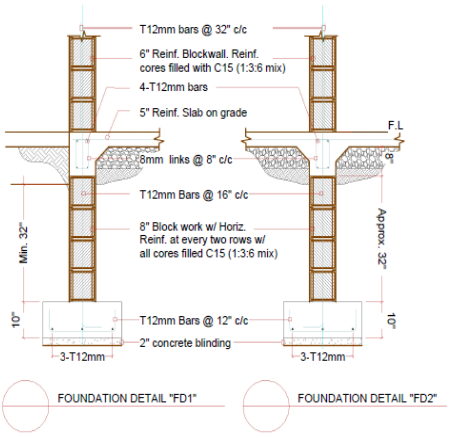


Appendix 4: Structural Drawings

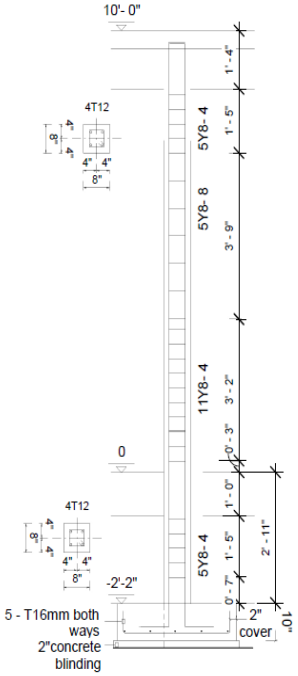




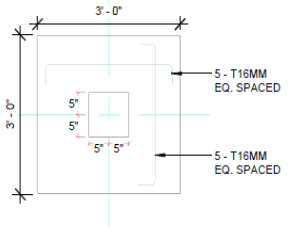
1 3D Columns & Beams



3 FOUNDATION FOOTINGS
1/2" = 1'-0"



2 COLUMN & FOOTING TYPICAL
1/2" = 1'-0"



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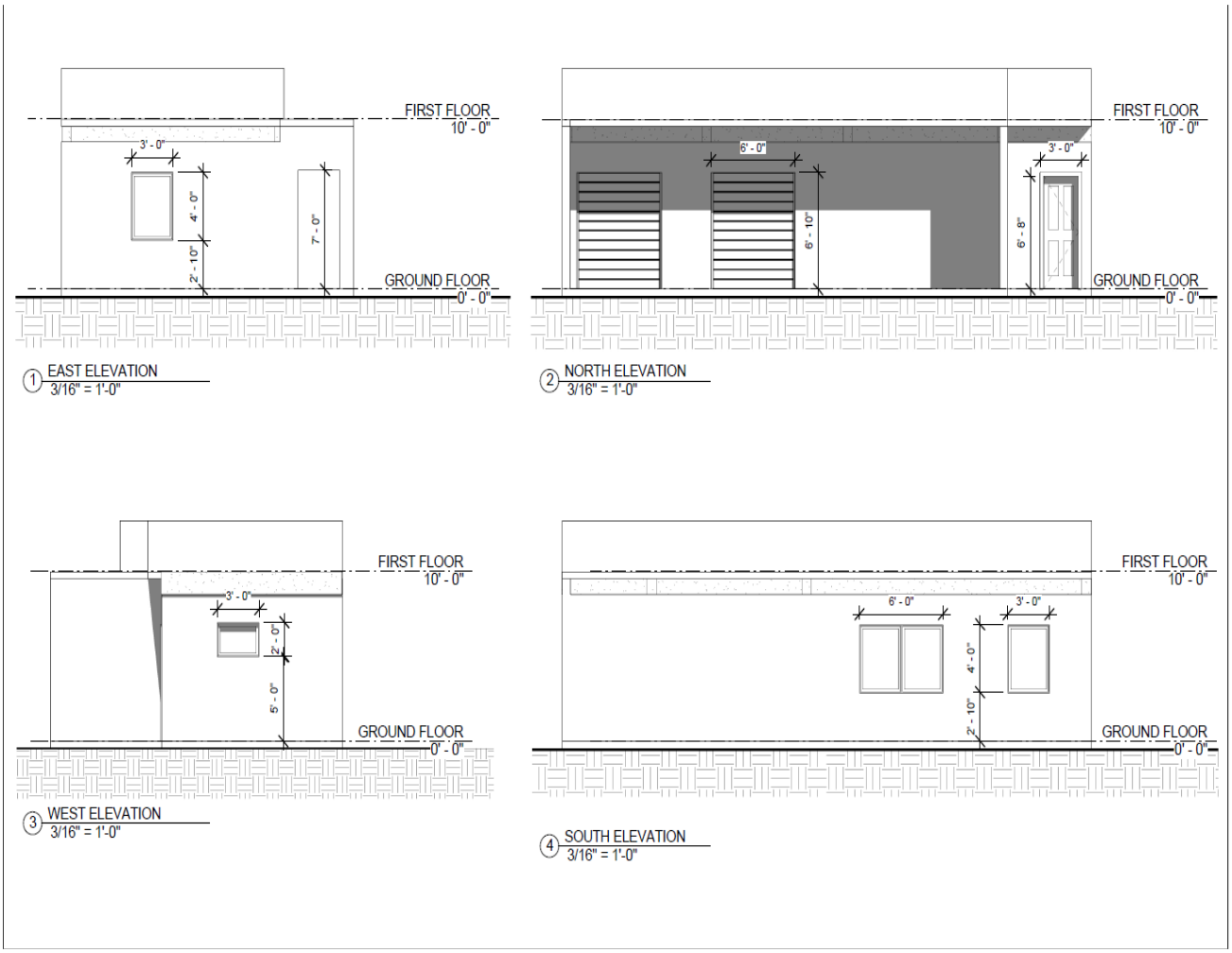


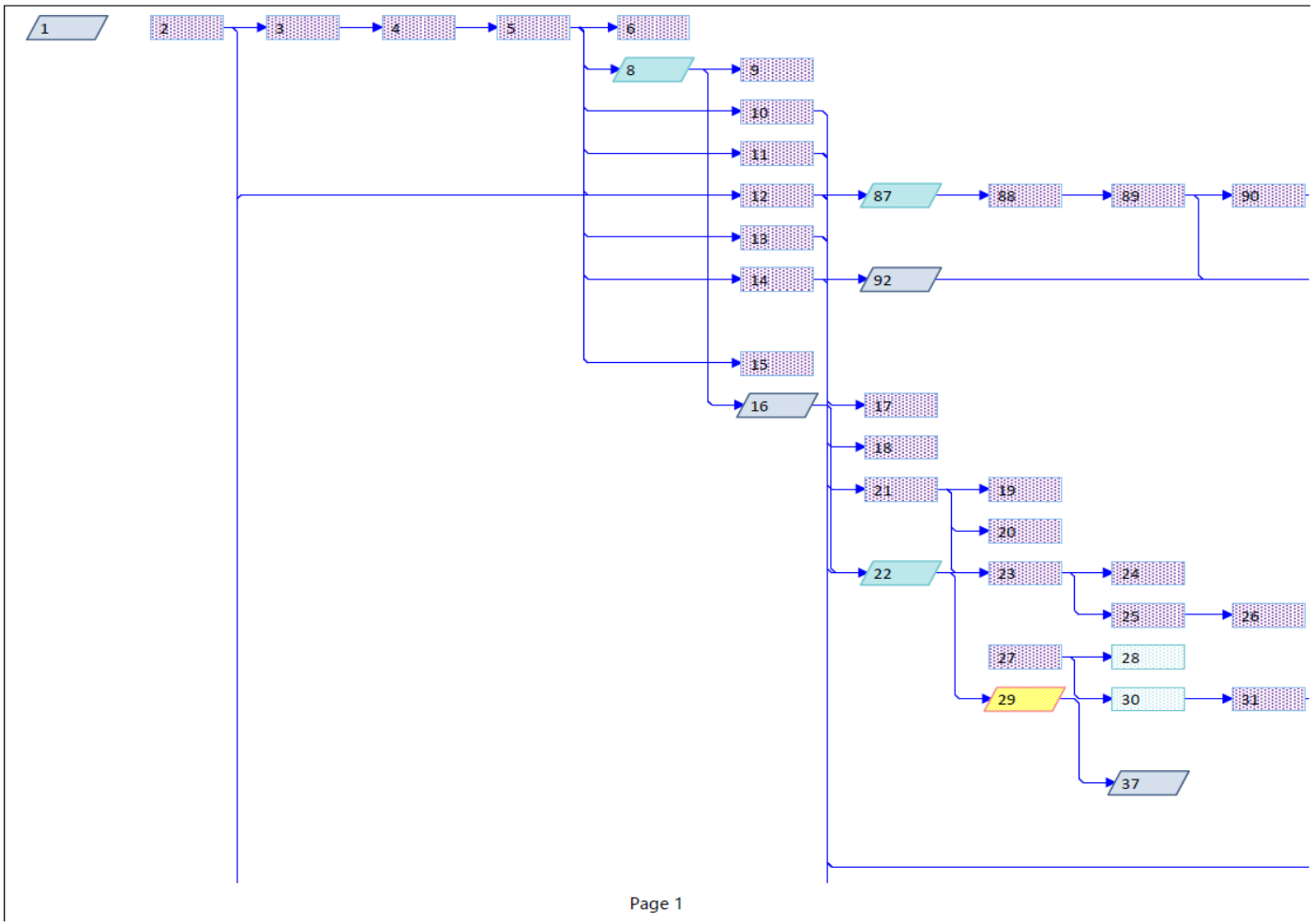
1 EAST ELEVATION
3/16" = 1'-0"

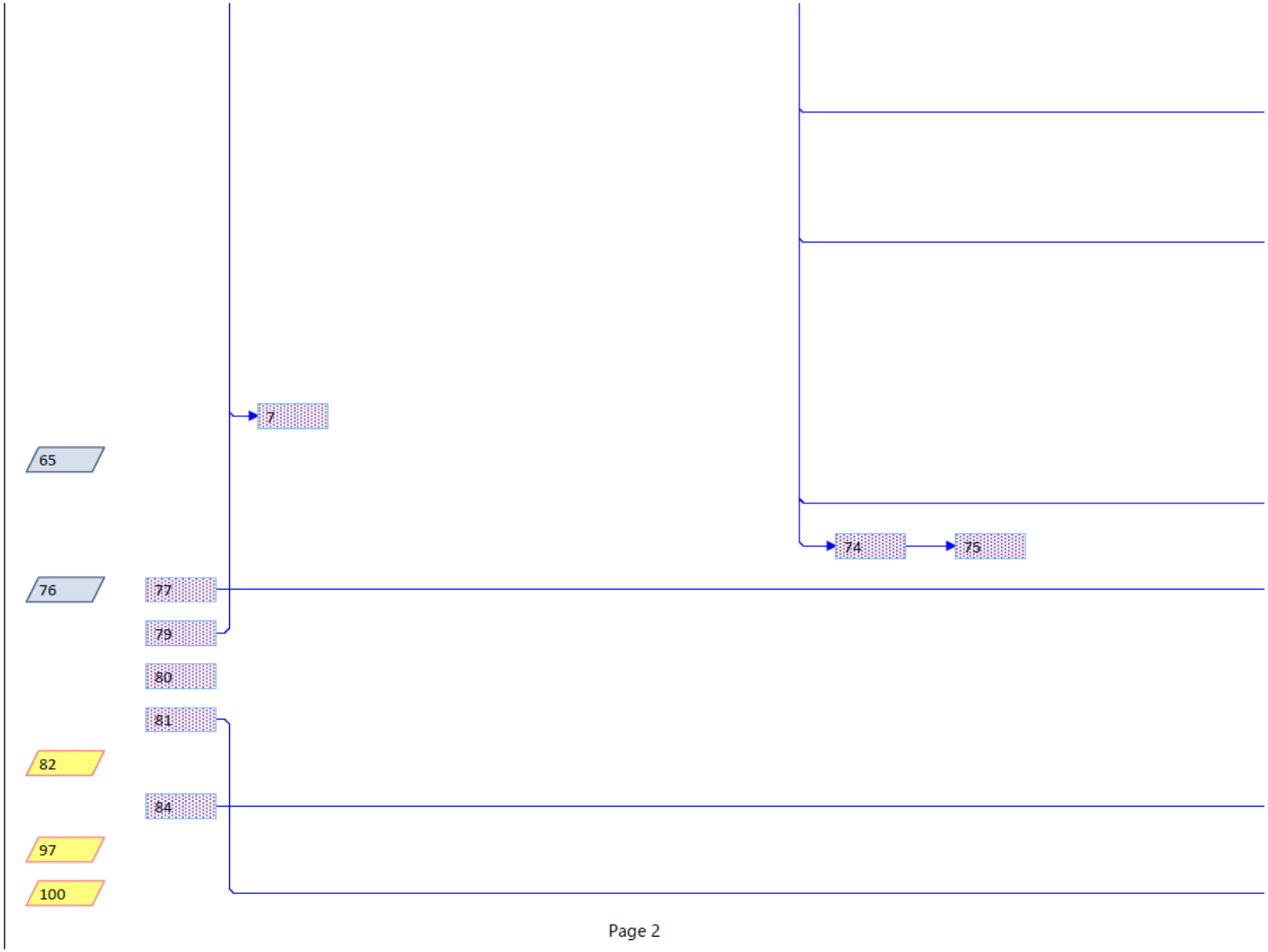
2 NORTH ELEVATION
3/16" = 1'-0"

3 WEST ELEVATION
3/16" = 1'-0"

4 SOUTH ELEVATION
3/16" = 1'-0"

Appendix5 : Network Diagram

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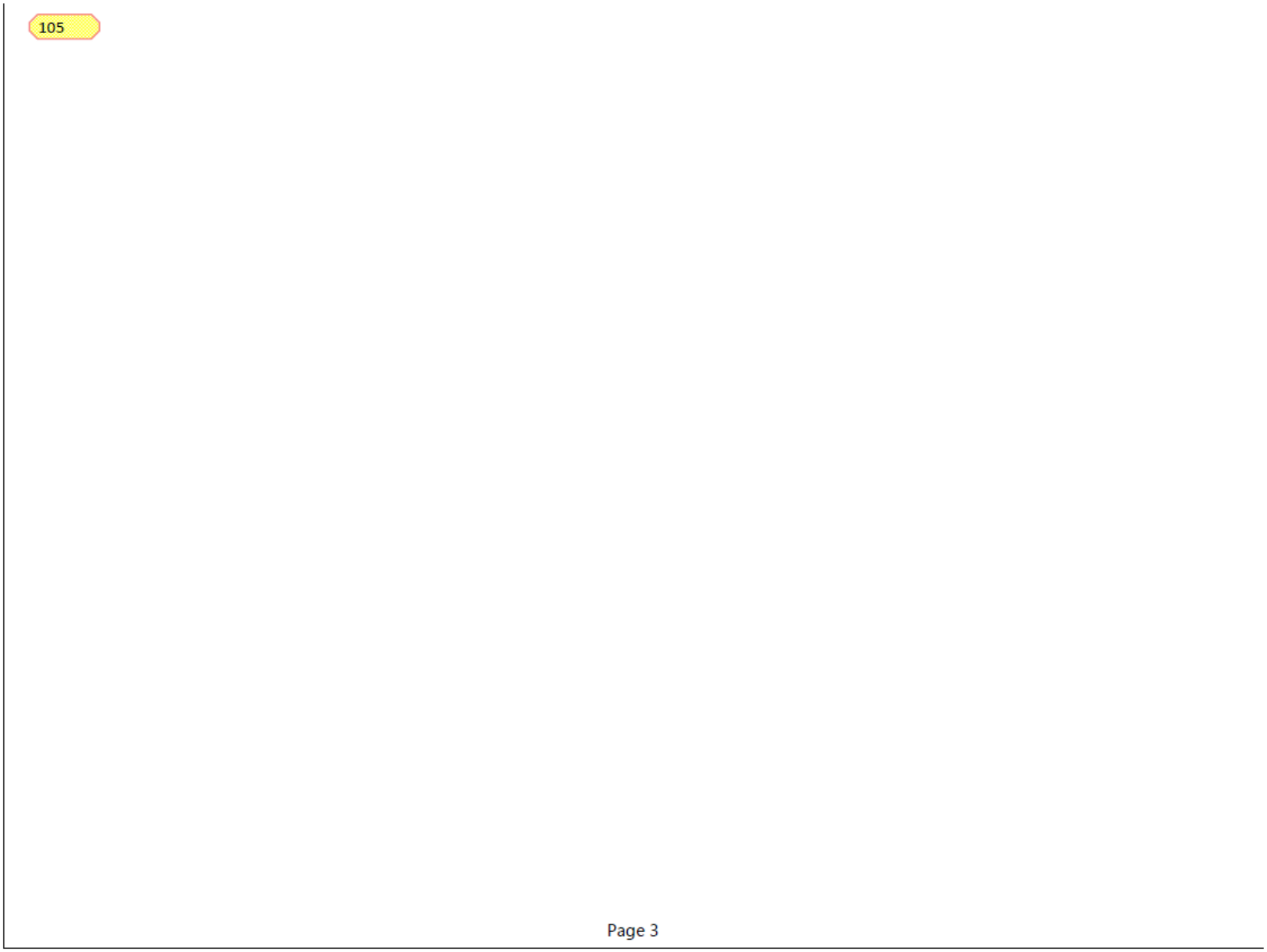
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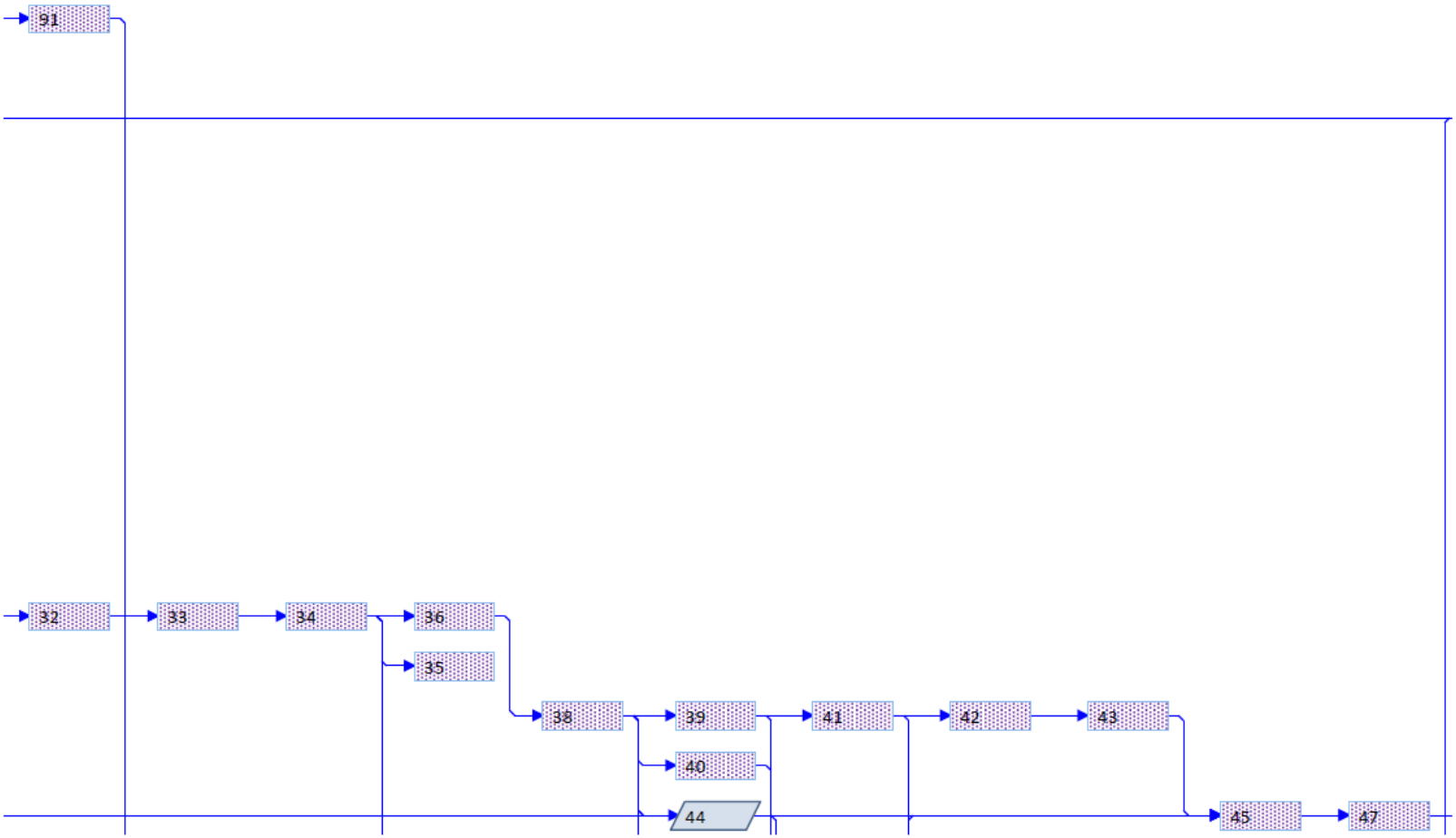

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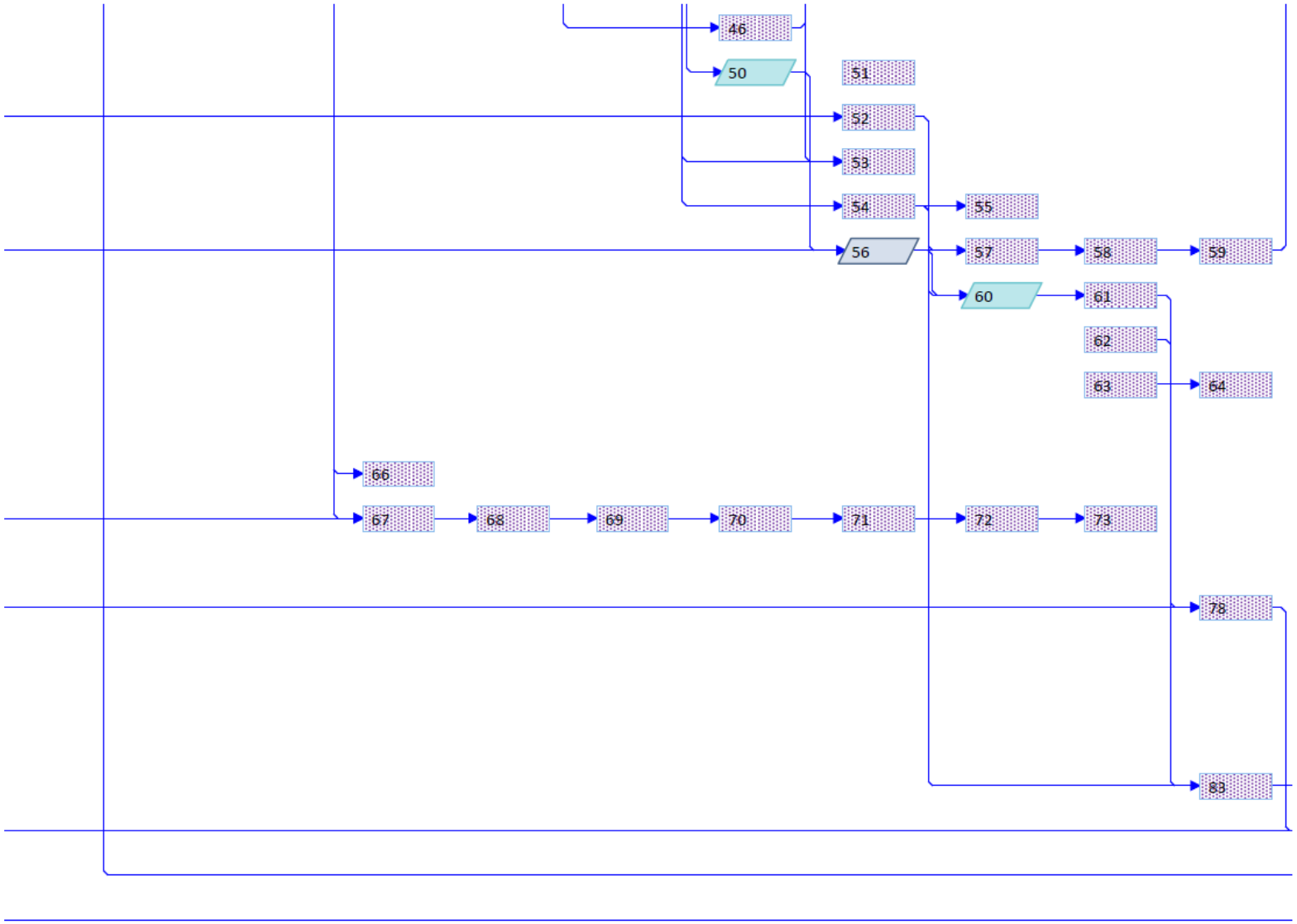
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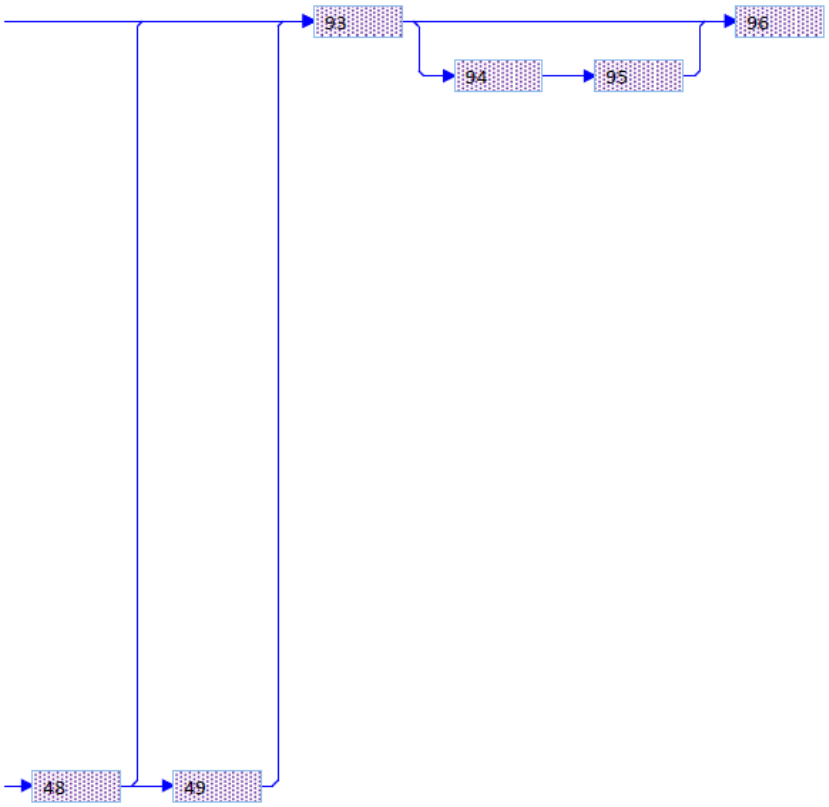
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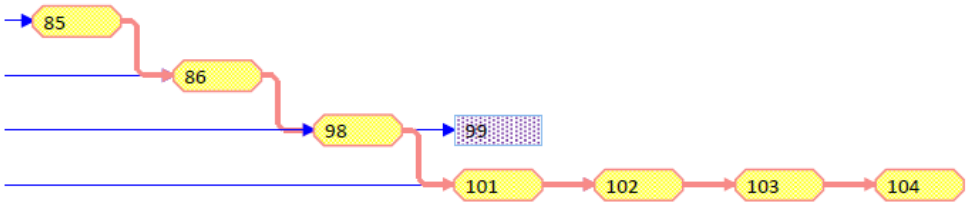
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Project: TM FISHING COLD STO
Date: Tue 9/22/20
Critical
Noncritical
Critical Milestone
Milestone
Critical Summary
Summary
Critical Inserted
Inserted
Critical Marked
Marked
Critical External
External
Project Summary
Highlighted Critical
Highlighted Noncritical
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