Asset Management
Project Management Manual

Version 3.0

Prepared by

The City of Winnipeg
Infrastructure Planning Division

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Corporate Finance Department
Winnipeg, MB. R3B 1B9

Disclaimer for Non-City representatives:

This Project Management Manual (Version 3) is prepared by the City of Winnipeg for its own internal purposes and parties hired to represent the City in projects. The City of Winnipeg makes no representations, warranties or guarantees as to the accuracy or sufficiency of this Project Management Manual or the information contained herein. Further, notwithstanding your use of this Project Management Manual or the information contained herein, you have been engaged by the City to provide professional advice and services and are expected to do so in accordance with your contract and all applicable professional and industry standards.

The Asset Management - Management System (AMMS) is not fully developed and implemented

The AMMS governance structure includes the Asset Management Policy, Administrative Standard, Investment Planning Manual and this Project Management manual. These governance documents are at various stage of development and not all the documents including procedures and templates have been finalized.

As you read the manual, you will notice some sections that are noted as "Future development or under-development". These elements will be incorporated and made available as finalized.

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1 Introduction

1.1 Background

In 2008, the City Auditor engaged Pegasus-Global Holdings to review required procedures and the project management and control practices for the City of Winnipeg's Capital program. The resultant report made 29 recommendations for improvement of the City's Capital Project Management. Three of the recommendations involved revisions to the draft Project Management Manual that was developed by the City in 1992, but never finalized or formally adopted.

In response to these recommendations, and due to the significant evolution in project management best practices between 1992 and present, the City engaged CH2MHill to aid in the development of this manual. This manual has been developed based on the Project Management Book of Knowledge (PMBOK), which is generally regarded to be North American best practices in project management. The manual has also been developed to be consistent with existing Council adopted policies and accompanying Administrative Directives.

The status of this manual is that it has been finalized and is available for use, but not yet mandatory for all projects. In transitioning to this new methodology, departments will be requested to begin piloting the process on projects and to provide feedback to the Manager of Capital Projects. There are a number of accompanying forms in development and there is staff training that will be necessary before the manual can become mandatory for all City capital projects.

This manual is meant to be a living document and as such, will be updated on a periodic basis by the Manager of Capital Projects. This manual is expected to be updated in the first year of release based on department experience from piloting the manual as well as for additional recommendations made by the City Auditor on subsequent audits which are being addressed.

The 2008 City Auditor report also made two recommendations (Recommendation #19 and #22) as to the requirement for additional resourcing both corporately and in departments to fully implement the recommendations as set out in their report. Currently, there is an accompanying human resource plan that is being considered as part of the 2015 budget process. The processes as currently laid out in the manual would require further revision to be deliverable within the existing resources.

While project management processes are subject to continuous improvement, the issuance of this manual is a significant milestone in improving the consistency and quality of capital project delivery in the City. This manual has taken considerable time and effort to develop, both on the part of City staff and our consultant partners. We wish to thank City staff, project delivery departments and our consultant partners for the considerable time, effort and support that went into the development of this manual.

1.2 Purpose of the Project Management Manual (PMM)

City of Winnipeg (the City) approves a large capital program every year for expanding, upgrading, and renewing its infrastructure and providing services to support its operations. New construction and repair or replacement of streets, bridges, sewer systems, community infrastructure, IT systems and amenities

accounts for most of the capital budget. With aging infrastructure, city growth, and environmental regulations, expenditures will likely continue to be greatest in these areas.

The traditional method of delivery for large projects has been through a design-bid-build (DBB) process. In DBB, City Project Managers (PMs) engage Consultants to design and prepare bid documents for the work, which is then awarded to Contractors for construction. The DBB process will continue to be the main delivery method for project delivery in the City, however for major capital projects where significant risks exist, the City will consider other delivery methods (including P3).

This Project Management Manual (PMM) has been developed and is being implemented to provide consistency in project delivery in the City. It is to be used by all business units in all departments for delivery of Capital Projects in the City.

This manual is largely based on the Project Management Body of Knowledge (PMBOK), which is generally considered to be best practices for project management in North America. Following best practices for project management is intended to improve the quality of projects being delivered by the City. By following a defined methodology, the manual will lead the PM through the process of properly initiating, planning, executing, monitoring/controlling and closing the project. This is meant to aid the PM and will not replace the experience and judgement required to deliver quality projects that meet customer expectations of cost, quality/scope and schedule.

The PMM is a how-to document for both City and Consultant PMs to use for delivery of projects. Initially prepared in response to a need for use on large and complex capital construction projects, the manual applies to all Capital Projects. It is important to emphasize that, while the PMM prescribes a standard methodology, it is not intended to be applied on a one-size-fits-all basis, however is a flexible method that can be tailored to the size and context of a specific project.

The manual is intended to help PMs be proactive. A desired outcome of a more proactive approach is increasing the confidence of stakeholders and the credibility of the project management discipline. Defining processes and procedures more clearly facilitates communication and understanding of expectations for all project stakeholders.

For the PM, the PMM addresses the following questions about project delivery:

- What steps are involved?
- What processes are applied?
- How are the processes applied?
- What are the PM's roles and responsibilities?
- What tools and templates are available?

As a living document, the PMM should be continually reviewed and updated by the Manager of Capital Projects. Update sources may include an internal lessons-learned process, observations from quality assurance reviews, and new information published in *A Guide to the Project Management Body of Knowledge*, Fourth Edition (PMBOK Guide; Project Management Institute [PMI], 2013) and its updates and other industry sources.

1.3 How to use the PMM

A Project Manager has a few options in how to use the PMM. The key methods are below:

- Go to the specific project delivery process chart in Appendix A and follow the delivery process along. The process steps have references to specific section in the manual, procedures and templates. Follow those reference links to obtain more detailed information on that step in the process.
- From a template use the reference links identified to go to specific sections in the manual and procedures.
- In the manual, use the table of content to find the section that contains the information you are interested. Within each section there are references to other sections, procedures or templates

Note:

The hyper-links are not active at this time. These hyper-links will be activated once the content becomes more stable

Not all the referenced material and documents are completed and integrated into the manual. I.e. not all the templates have been finalized and only the DBB delivery process is included. More content will be included with subsequent versions of the manual.

1.4 Structure of the PMM

The PMM project delivery methodology was developed by applying PMBOK project management standards to the City of Winnipeg's specific situation. Alignment with PMBOK leverages the investment in corporate and institutional training programs and reinforces use of a common project management language and structure throughout the organization.

The PMM was structured according to PMBOK's five process groups (Figure 1-1), rather than using a project life-cycle phase approach. This structure allows a single description of the processes that are repeated in each phase; deliverables for each phase are identified in the delivery framework in Section 3.2.

The PMM contains the following sections:

- **Section 1.0 - Introduction –** This section introduces the PMM and explains its use.
- **Section 2.0- Governance –** This section provides the governance associated with project management and interactions with other City programs and models.
- **Section 3.0- , Project Delivery Framework –** This section describes how all the project management components are integrated into a single unified approach.
- **Sections 4.0 to 8.0- Project Management Process Groups –** These five sections detail what is to be done and how to do it, describing what is expected in terms of processes and outcomes or deliverables.
- **Appendix A- Process Charts –** These charts show role responsibilities for specific actions and are the primary reference to use to determine the sequence of operation. Processes in the chart can be matched with detailed descriptions of *what* to do given in Sections 4.0 to 8.0, and with steps for *how* to do it given in Appendix E.
- **Appendix B - Templates –** These templates and forms facilitate presenting information consistently and coherently across the organization.
- **Appendix C- Alternative Project Delivery –** This Technical memo provides information of alternative project delivery options.
- **Appendix D- Glossary -** The glossary defines the terms, acronyms, and abbreviations used in this PMM.

- **Appendix E- Procedures –** These procedures are detailed, step-by-step instructions on how to complete specific steps of the processes.

Figure 1-1: Standard PMM Project Phases and PMBOK Process Groups

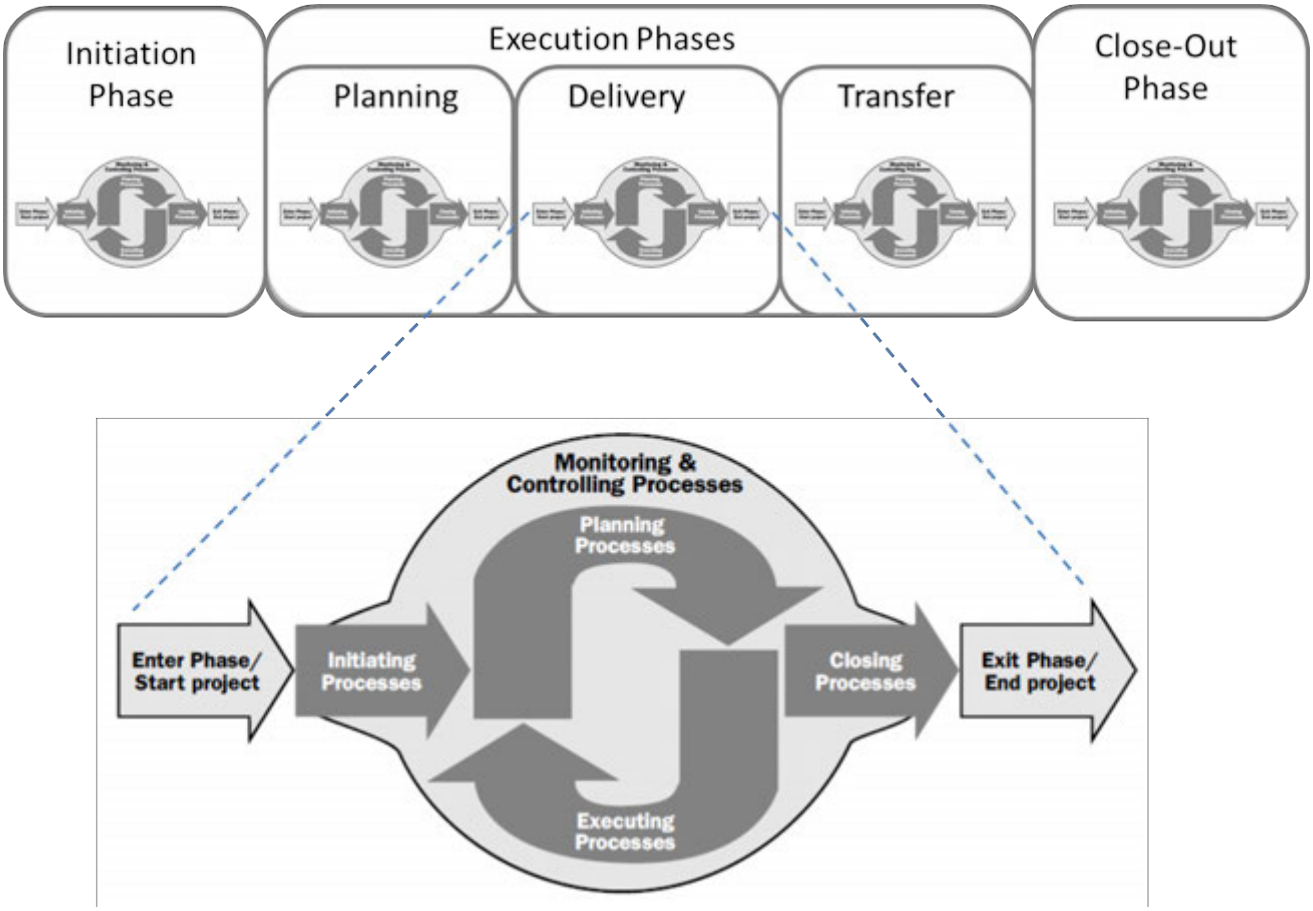


Figure 1.1 shows the relationship between project phases and the process grouping structure used in this manual. Each of the project phases includes the five process groups as shown in the lower graphic blow-up. Descriptions for these process groups are presented in Sections 4.0 to 8.0 of the manual. By example, the Initiating processes for the initiation, execution and close-out project phases are described in Section 4.0 of the manual. The process workflow is presented for a specific project delivery method in Appendix A.

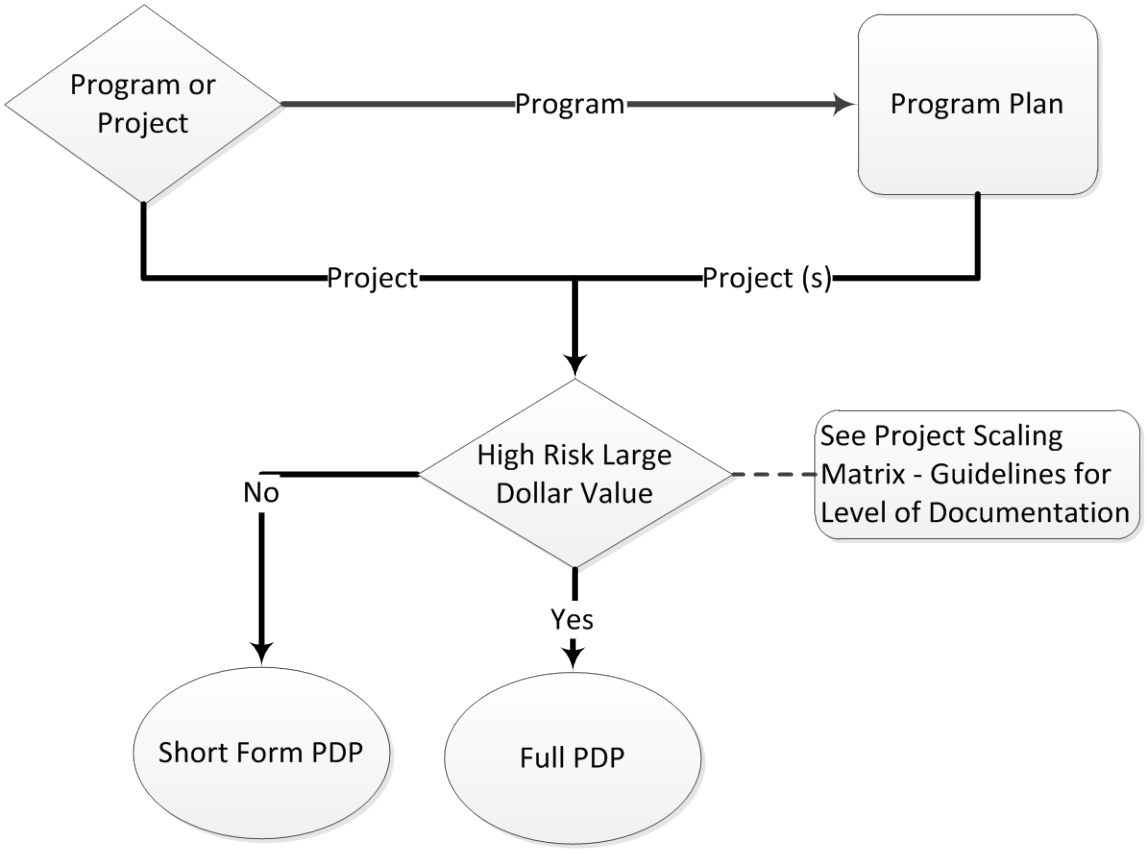
In addition to PMBOK, the project management methodology described in Projects in Controlled Environments 2 (PRINCE2) was also reviewed during development of the PMM. This industry-leading, process-driven reference is used in over 20,000 public and private organizations and has been applied on thousands of projects worldwide. It was developed by the United Kingdom's (UK's) Office of Government Commerce and is required by the UK government. Unlike PMBOK, which provides standards however not a prescribed methodology, PRINCE2 provides a structured methodology and gives direction on applying its concepts.

One PRINCE2 feature adapted for the PMM is use of "phase gates." Phase gates initiate a phase-end review and a response to a phase's deliverable(s). As the final process of the closing process group, a phase gate is included at the end of each project phase.

1.5 Documentation Requirements/Scaling the PMM

The documentation required by the PMM will differ depending on the nature of the approved Capital Budget. This section will guide the PM through the determination of the required documentation.

Figure 1-2: PDP Selection Guide



When to use a Short Form Project Delivery Plan (PDD)

Program or Project

The first decision point is the determination if the capital authorization is either a program or a project. In most instances, identifying whether a budget is a program or a project is relatively straight forward. Appendix D of this manual provides definitions of both a program and a project as follows:

> ***Program*** – a group related projects managed in a coordinated way to obtain benefits and control not available from managing them individually.
>
> ***Project*** – a temporary endeavour undertaken to create a new project, service or result.

The approved Capital Budget may also identify the budget as a program or a project.

If the budget authorization is a program, then the PM is required to complete the documentation required for the Program Delivery Plan. It should be noted that if there are any individual projects within the program that meet the requirements for full PDP as set out below, then the full PDP must be completed for that project.

Short PDP or Full PDP

If the budget authorization is for a project, then the level of documentation will be dependent on both the risk and size of the project.

The PM should first make an overall risk assessment of the project and determine the level of risk as either 'High', 'Moderate' or 'Low'. Project complexity, project specific risks, potential to impact service delivery, potential to impact tax/utility rates and public profile are some of the considerations in determining project risk. The definitions of project risk are as follows:

High Risk – The risk is severe and if it occurs has negative effects that could greatly impact the project's cost, schedule, scope and quality putting the project in jeopardy of being completed on time and on budget.

Moderate Risk - The risk has negative impacts on cost, schedule, scope and quality and if it occurs could put the project in jeopardy of being completed on time and on budget.

Low Risk - The risk is minimal and the impact on cost, schedule, scope and quality is such that it should not jeopardize the project from being completed on time and on budget.

In assessing the level of risk as defined above, the PM should consider the following potential outcomes:

- If there is any potential impact on health and safety of the pubic or employees
- If there is any potential to impact/interrupt service delivery to the public
- If there is any potential impact on City finances including additional borrowing or increases to property taxes or utility rates
- Reputational risk to the City of Winnipeg
- Potential to disrupt the City's workforce in the performance of their daily duties
- Project complexity
- If the project is non-repetitive in nature
- Potential for environmental impacts
- Other project specific risks

The next assessment the PM must make is the category of project based on size. Project size is the taken from the approved Capital budget and fits into categories as follows:

- **Small** – below $1.0 million
- **Medium** -. $1.0 million to $4.99 million
- **Large** - $5.0 million to $9.99 million
- **Major** - $10 million and above

The following matrix is a summary illustration of the potential risk / size classifications for any given project:

Project Scaling Decision Matrix - Risk/Size

		Project Size			
		Small	**Medium**	**Large**	**Major (XL)**
Project Risk	**High**	High/Small	High/Medium	High/Large	High/Major
	Moderate	Moderate/Small	Moderate/Medium	Moderate/Large	Moderate/Major
	Low	Low/Small	Low/Medium	Low/Large	Low/Major
		Below $1.0 million	**$1.0 million to $4.99 million**	**$5.0 million to $9.99 million**	**$10.0 million and above**

The following matrix is an illustration of the documentation requirements based on project Risk / Size.

Project Scaling - Guidelines for Level of Project Documentation

		Project Size			
		Small	**Medium**	**Large**	**Major (XL)**
Project Risk	**High**	Full PDP	Full PDP	Full PDP	Full PDP
	Moderate	Short PDP	Short PDP	Full PDP	Full PDP
	Low	Short PDP	Short PDP	Short PDP	Full PDP
		Below $1.0 million	**$1.0 million to $4.99 million**	**$5.0 million to $9.99 million**	**$10.0 million and above**

The above matrix was developed considering impact on resources and cost benefit. The major objective is to expend additional resources where there is significant risk or large dollar amounts at stake.

Major Capital Projects are normally very complex and due to their size, cost overruns can have an impact on taxpayer rates. As such, a low/major classification is very unlikely. The PM should reassess any 'low/major' classifications carefully prior to finalization.

Bundling of smaller projects together is a fairly common occurrence in programs such as Local Streets. Local Streets packages would tend to fall in the 'low/large' category. Due to the low risk nature of small projects, bundling several small projects does increase project risk. Short Form PDP is recommended for this classification.

The appropriate level of reporting/documentation should be determined by the PM and approved by the Project Sponsor.

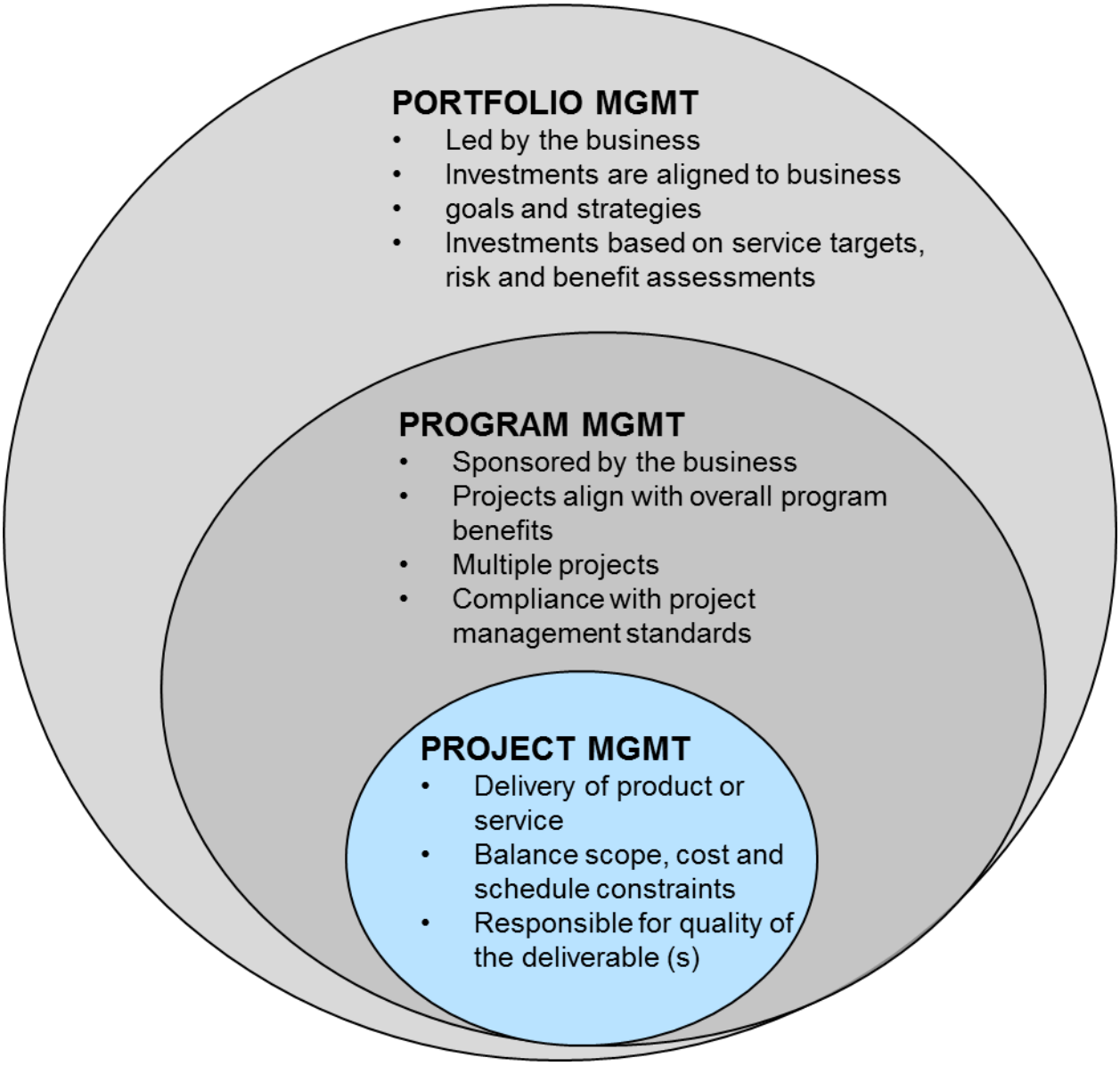
For projects that only require the Short PDP, the PM may find there to be additional value supplementing the short PDP select templates from the Full PDP. Examples would include supplementing the short PDP with a Project Charter or Project Risk Matrix. Therefore, while not a requirement, the PM is encouraged to use the additional templates to supplement the Short PDP where it would add value.

1.6 The Portfolio, Program, Project Management and Change Management Disciplines

Management of portfolios, programs, and projects is aligned with and driven by organizational strategies. Each level of management contributes in different ways to achievement of strategic goals (Figure 1-3):

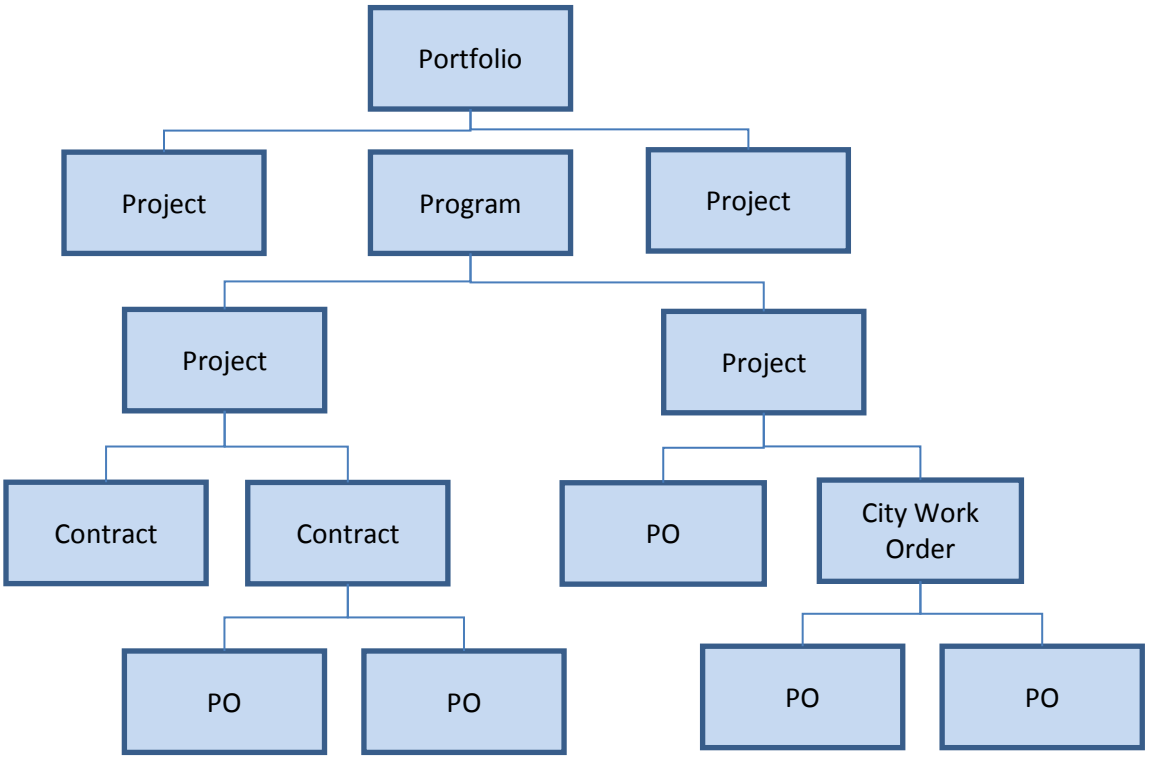
- **Portfolio Management –** Centralized management of programs and projects at both the corporate and department levels to achieve the City's strategic objectives for services and assets.
- **Program Management –** Management of a group of projects to obtain the benefits (or result) according to an agreed-upon business case and control not available by management of projects individually.
- **Project Management –** Management of an endeavour of finite duration undertaken to create a unique product, service, or result according to an agreed-upon business case (which addresses how an idea is developed into a viable investment proposition).

Figure 1-3: Portfolio, Program, and Project Disciplines



The hierarchical relationship between delivery components is illustrated in Figure 1-4. Each component can have multiple subcomponents; that is, relationships can be “one-to-many.”

Figure 1-4: Portfolio, Program, and Project Relationships



1.7 Other Key Disciplines

- **Contract Administration –** As identified in Figure 1-4, contracts and the administration of those contracts (contract Administration) is significantly involved in and integrated with project management. The role includes managing contract relationships, monitoring contract performance, and modifying contracts as appropriate.
- **Change Management** - Refers to the management of *organizational* change and as such, should not be confused with *change control*. Change management is a discipline that offers a structured approach that is aligned with Project Management Institute (PMI) project delivery lifecycle. The purpose of change management is to promote and enable the adoption of changes that may occur as the result of project delivery, and thereby to support the achievement of project results and outcomes.
- **Public Engagement** – refers to a process, involving communication and interaction between the City of Winnipeg and its residents that serves to inform and involve the public, and uses public input to make better decisions. The purpose of engaging the public is to achieve decisions that are sensitive and responsive to community values and concerns. It ranges from the mere provision of information through to empowering the community to make decisions as outlined in section 5.8.

1.8 Integration with the Asset Management - Management System

The City has adopted an Asset Management - Management System (AMMS) that aligns with International Organization for Standardization (ISO) 55000 standards and the British Standards Institution's (BSI's) Publicly Available Specification (PAS) 55 asset management system. The AMMS defines the framework for integrating asset management components throughout an asset's life cycle. This framework will help establish a common language and direction within the City's multi-functional organization.

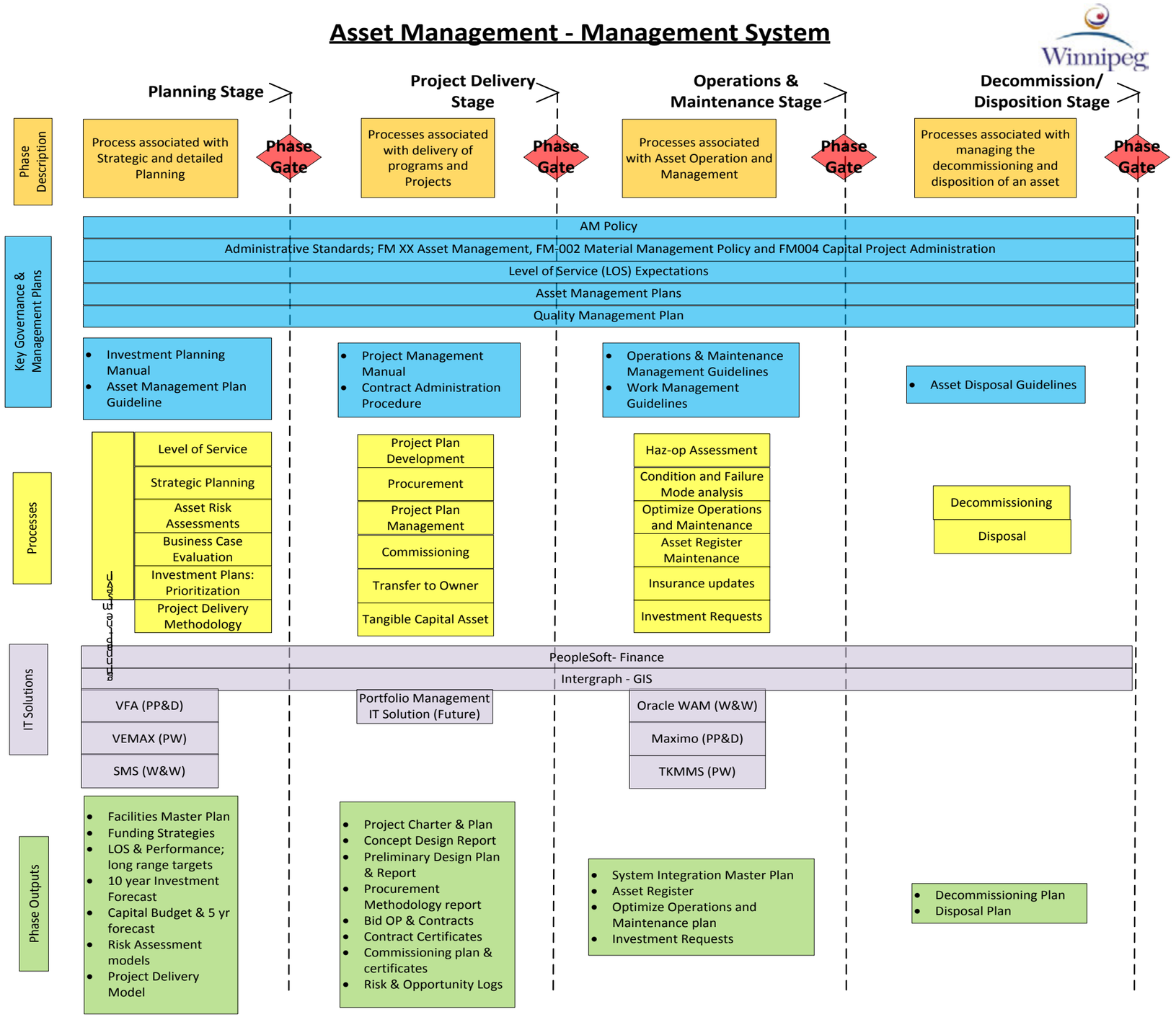
The AMMS establishes a disciplined approach to creating the best stakeholder value for each asset portfolio. This approach requires breaking down departmental barriers; establishing planning, coordination, and prioritization; and rationalizing competing performance goals. As illustrated in Figure 1-5, the AMMS is defined in terms of governance, processes, and outputs. These elements frame how the City manages its assets.

Governance is at the core of the model (centre of the circle) and provides the policy, directives, and rules for managing the assets. The defined processes (middle circle – yellow area) define how work will be done in order to optimize costs and performance. A sample of the process outputs are noted in the outer circle (green).

The AMMS makes an important distinction between a ***product*** life cycle and a ***project*** life cycle. The product life cycle extends around the full circumference of the circle in Figure 1-5 (above), from creation (investment planning) through to retirement and final disposal. Products may be in various forms, such as roads, bridges, buildings, or sewer assets. The project life cycle is confined to the project delivery stage of the circle in Figure 1-5.

The project delivery stage (lower right quadrant of the circle) addresses implementation of projects for products or service where an asset (product) is physically created. The two key integration points for the product life cycle are with the adjacent planning stage and with the operations and maintenance stage. The integration points in the planning stage are the business case and budget approval processes. The integration point in the operations and maintenance stage is the formal transfer of defined documentation, such as instructions for operations and maintenance of the completed product or service.

Figure 1-5: City of Winnipeg Asset Management - Management System



1.9 Change Management

Change management refers to the management of *organizational* change and as such, should not be confused with *change control*. Change management is a discipline that offers a structured approach that is aligned with Project Management Institute (PMI) project delivery lifecycle and the City's Project Delivery Framework. The purpose of change management is to promote and enable the adoption of changes that may occur as the result of project delivery, and thereby to support the achievement of project results and outcomes.

The City of Winnipeg has certified Change Managers (ChM) located in every department who form a Change Management Working Group sponsored by the CAO. This group is a change management resource pool for projects. Its members are trained to apply tools and methods for change management within the change lifecycle framework.

Project Managers should know who their departmental Change Managers are and should engage them in all the Phases of the project lifecycle. For a list of departmental Change Managers, refer to the distribution list in MS Outlook, CITY-ADKAR-Change-Managers, or contact the Manager, City Asset Management Program.

PMI recognizes that change management is an important feature of project management and successful project delivery. Without attention to change management, less than 40% of projects are successful. Thus, the inclusion of change management activities within the project delivery model is essential for minimizing barriers to change and for ensuring rapid and effective implementation of project outcomes.

When a PM develops the project's stakeholder assessment in the Project initiation phase, the need to follow the City's formal integrated change management procedure should be identified. This need should be included in the Project Charter and discussed with the Project Sponsor.

By following the change management procedure together with developing the PDP, a PM will formulate a solid plan to manage the change created by the project.

The PM may assign a separate Change Manager, if applicable. Criteria could be developed based on project complexity, risks, financial loss, quantity of stakeholders, rushed timeline, etc. For projects deemed high risk, a separate Change Manager could be assigned and implement the ADKAR model which would be of great assistance for the PM.

1.9.1.1 How to do Change Management

Refer to Appendix E "Change Mgt Procedures" for the details of how-to manage the change created by initiating a project

1.10 Public Engagement

Public Engagement is a process, involving communication and interaction between the City of Winnipeg and its residents that serves to inform and involve the public, and uses public input to make better decisions. The purpose of engaging the public is to achieve decisions that are sensitive and responsive to community values and concerns.

In order to achieve its intended purpose, engagement must be meaningful. This means that it:

- acknowledges the community's desire to participate in decisions that affect them and provides a means for incorporating the public's values, interests, needs and desires into decisions;
- facilitates understanding – by both the public and the decision-makers – regarding:
    - the definition of the problem or opportunity being addressed,
    - the issues of relevance,
    - the common ground from which options for a solution can be developed and evaluated,

    - the rationale for the ultimate decision;
- improves decisions as it:
    - identifies critical issues early, when flexibility in the process is greatest, and
    - brings all perspectives to the table, thereby improving the likelihood that a broader range of perspectives is addressed, there is a positive attitude towards decision outcomes, and therefore that it is less likely to result in decisions being overturned or vetoed;
- opens doors to innovation, creative problem solving, improved service, greater efficiency and win-win conflict resolution.

The Project Manager may assign a separate Public Engagement advisor or coordinator to oversee the detailed development and implementation of a Public Engagement Plan that supports the overall Project Delivery Plan. Criteria could be developed based on such things as project complexity, risk, quantity of stakeholders and significance of their interests. This Engagement Coordinator role could be filled by an external public engagement consultant. When hiring a PE consultant serious consideration should be given to hiring them as an independent consultant rather than a sub to another consultant being hired for the project, since public engagement is concerned with sensitivity and responsiveness to community values and concerns for the overall project.

1.10.1.1 How to do Public Engagement

Refer to Section 5.8 Plan Communications. Appendix E “Public Engagement Procedures” under development.

2 Project Management Governance

Governance is at the centre of the AMMS presented in Figure 1-5 and applies to all stages of the AMMS. It includes the policies, directives, standards, and rules defined by the corporation in documents. City governance documents that provide direction for project delivery are listed in Table-2-1.

Table 2-1: The City's Project Delivery Governance Documents

Governance Document	Remarks	Link
Materials Management Policy	City's Procurement Policy	http://www.winnipeg.ca/matmgt/info.stm
Administrative Standard FM-002	Material Management Administrative Standard	http://citynet/cao/administrative_directives/financial_management/default.stm
FM-004 Capital Project Administration	Currently under review	
Administrative Standard Asset Management	Currently under development	Website under development.
Special Operating Agency (SOAs) Operating Charters	While SOA's adhere to the Materials Management Policy guidelines and other directive listed above, the Operating Charters of the SOAs note other delegations and exemptions for purchasing authorities	Individual SOAs have their operating charters on file.

In some instances, in order to assist the project manager in the delivery of capital projects, the PMM may contain discussion certain Policies and Administrative Directive. Should there be any cases of conflict between the manual and these other documents, the Policy/Administrative Directive shall take precedence. Any cases of conflict should be brought to the attention of the Manager of Capital Projects. The manual is not meant to fully replace or replicate Policy/Administrative Directives, as such the PM should read and become familiar with the relevant Policy/Directive and not rely solely on the discussion in the PMM.

2.1 Policies

ASSET MANAGEMENT POLICY

THE ASSET MANAGEMENT POLICY IS CURRENTLY UNDER DEVELOPMENT.

MATERIALS MANAGEMENT (MM) POLICY

The MM Policy was adopted by City Council in 2004 and governs the Materials Management functions covering most types of procurement, including those normally associated with consulting services and capital project delivery. Guiding principles for the document were to meet the City's needs effectively and efficiently, at the best value, and in a fair and ethical manner.

While providing for broad-level governance, the Materials Management Policy also stipulates conditions under which authority is delegated to the administration. The Materials Management Policy grants the chief administrative officer (CAO) the authority to approve directives consistent with the Policy, and provides the authority to further delegate certain responsibilities.

2.2 Administrative Standards

An Administrative Standard (FM-002) and a Directive FM-004 (NOTE: THE CITY IS CURRENTLY UPDATING FM-004 TO ADDRESS A NUMBER OF AUDIT RECOMMENDATIONS) relate to process clarifications, procedural requirements, and delivery for management of projects.

FM-002 provides direction on the following:

- Delegation of authority from the CAO to other levels of administration
- The procurement – solicitation process
- Procedures for soliciting and evaluating competitive offers
- Award report requirements
- Procedures to be used when award criteria are not met
- Award and signing authorities
- General requirements for engagement of Consultants
- Reference to the City authorities for dealing with contract over-expenditures
- Reporting requirements for Consultant assignments

FM-004 (SEE NOTE ABOVE RE REVISIONS TO FM-004) directly addresses project administration and describes the processes that must be considered when planning, delivering, and executing projects, specifically addressing the following:

- Roles and responsibilities of the following personnel/unit for major projects:
  - Chief Administrative Officer (CAO)
  - Chief Financial Officer (CFO)
  - Manager of Capital Projects
  - Departments
- Establishment and mandate of the P3 review committee
- Establishment and role of the Major Capital Project Steering Committee
- Project delivery process and procedures
- Management of unspent capital accounts
- Rules for project over expenditures

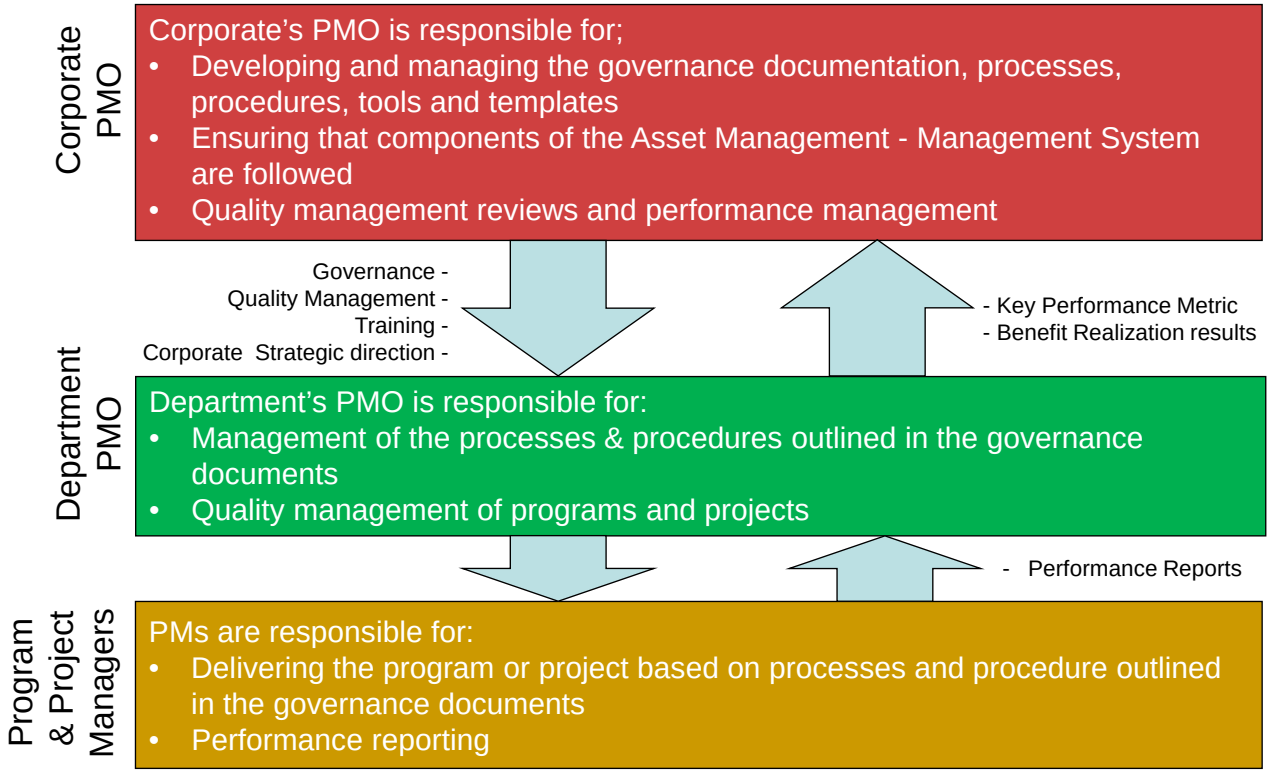
An administrative standard for asset management is under development and, when approved, will provide broad governance over the full life cycle of assets.

2.3 Organizational Governance

With City-wide adoption of the PMM, the City's corporate and departmental entities will need to shift towards a "Portfolio – Project Management Office (PMO)" organizational governance structure defined in Figure 2-1.

THE PMO CONCEPT IS CURRENTLY BEING ASSESSED TO DETERMINE THE IMPACT TO THE CITY ORGANIZATION AND HOW BEST TO IMPLEMENT THIS GOVERNANCE STRUCTURE. THIS SECTION IS BEING INCLUDED AS INFORMATION AT THIS TIME. ONCE FINALIZED, THE ORGANIZATIONAL GOVERNANCE WILL BE INCLUDED IN AN UPDATED FM-004.

Figure 2-1: City of Winnipeg Corporate and Departmental Governance Framework

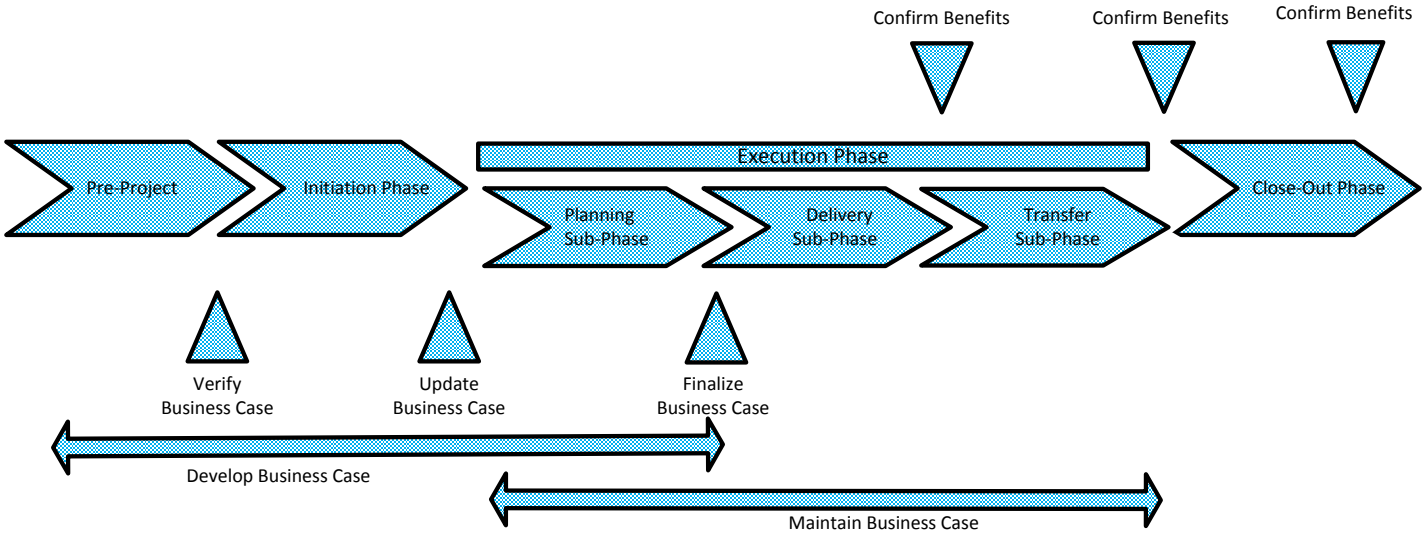


3 The Project Delivery Framework

3.1 The Project Delivery Framework

The goal of project delivery is to implement a project in accordance with its approved business case. Project delivery is carried out using a consistent framework that guides project planning and implementation. Project life-cycle phases for the framework are illustrated in Figure 3-1.

Figure 3-1: Project Delivery Framework Showing Project Phases and their Main Components



Project life-cycle phases are:

- **Pre-Project Phase** – This phase encompasses strategic planning, investment planning, and budgeting. These processes must be completed before project initiation. However, considerations for project delivery are integrated concurrently during business case development.
- **Initiation Phase** – This phase involves clearly defining the project from planning to delivery, developing a project charter
- **Execution Phase –** In this phase, processes are completed that result in a product. Activities and deliverables can vary widely between projects, however three sub-phases involving the following processes apply to all projects:
  - **Planning sub-phase: Planning** the delivery of the product, result or service
  - **Delivering sub-phase:** Delivering the product, result, or service per the project plan
  - **Transferring sub-phase: Transferring** the product or service to the Business Owner
- **Close-Out Phase –** As all projects have a defined life, this phase defines the processes and activities that end the life of a project.

Business Case – This is developed at the beginning of a project and maintained throughout the project's lifecycle. The delivery framework is tightly integrated with the business case and changes resulting from delivery need to be updated, verified, and validated in the business case. The business case establishes the baseline for assessing the initial investment decision, project risk, issues, or changes. Assessment involves determining how the matter affects the

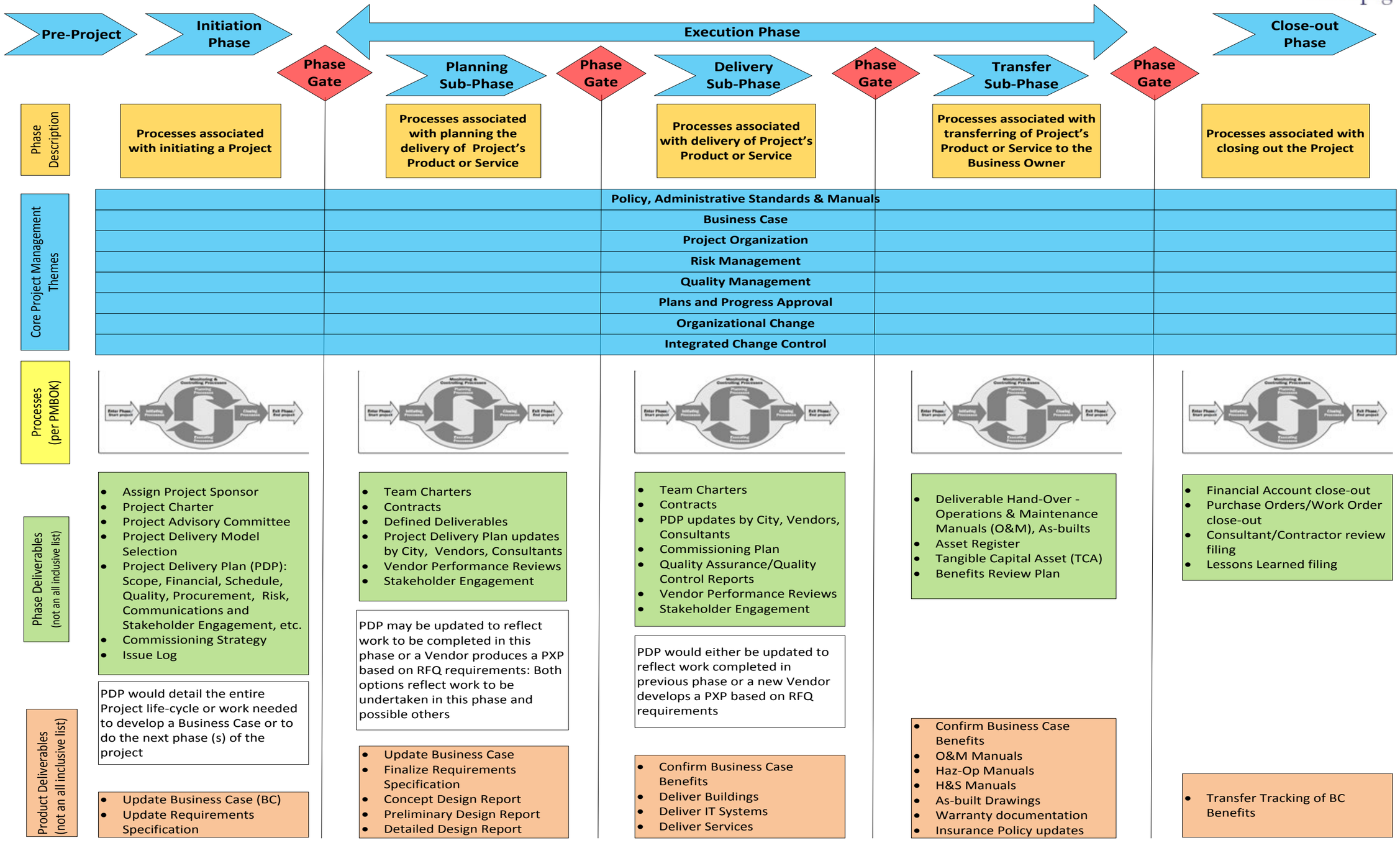
viability of the investment objectives and benefits. The milestone stages that include formal review of the business case during a project's life cycle are shown in Figure 3-1.

- **Develop Business Case –** Acquire information required to make the investment decision. Refer to the Investment Planning manual for more detailed information.
  - **Verification –** Assess whether the project has a valid business case to proceed.
  - **Update -** Update the business case with more detailed information not available until the project has expended resources to produce, i.e. planning studies.
  - **Finalize** – Approve the Investment to proceed or not based on the business case put forward. Information in the business case needs to be at a class 3 level per AACE.
- **Maintain Business Case** – Continue to reference the business case in assessing project change control decisions and tracking quantified benefits until the product is turned-over to the business owner or operations (Care & Use owner).
  - **Confirm Benefits** - Assess whether the intended benefits have been (or will be) realized; occurs primarily after the project is closed.

3.2 The Project Delivery Framework Integration

Figure 3-2 shows how the themes, processes, and deliverables of the project delivery framework are integrated.

Figure 3-2: Project Delivery Framework Component Integration



The primary components in the project delivery framework are:

- **Project Phases** – Project phases provide a high-level project delivery roadmap. They are generally sequential however may overlap.
- **Phase Gates** – Gates between project phases are logical points for reviews. Completion of a phase typically means completion of one or more deliverables. The phase gate review includes a status review and business case update to validate the benefits before authorization to continue to the next phase.
- **Project Management Themes** – A "theme" is a concept or direction that is common to all the project phases and is progressively developed or consistently applied in each. The PMM themes are described in Section 3.3.
- **Processes** – Processes are at the core of project delivery and identify what is to be done. PMBOK uses the process groups *initiating, planning, executing, monitoring and controlling,* and *closing*.
- **Project Phase Deliverables** – In project phases, specific results, referred to as project phase deliverables and outputs, are achieved that may then be used to manage the project and/or support delivery. For example, the project delivery plan (PDP) is a project phase deliverable or output used for management throughout the project.
- **Product or Service Deliverables** – The product or service deliverables are the project's results. An operations and maintenance manual and a new transit garage are both product deliverables.

3.3 Project Management Themes

Themes describe aspects of project management that must continually be addressed. To various degrees, themes are applied across all project phases. PMM themes include:

Note: The themes identified below were developed based on the PRINCE2 theme concept.

Table 3-1: Project Management Framework Themes

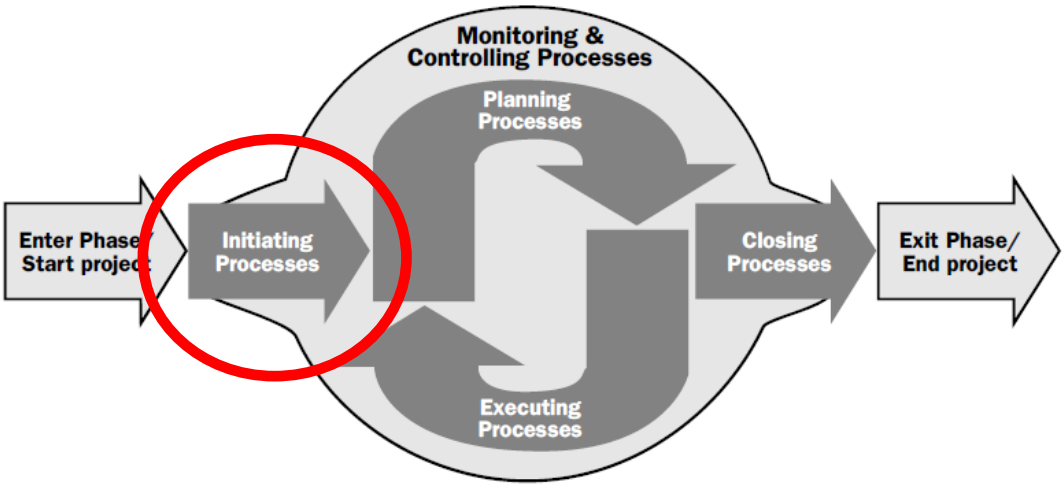
PRINCE2 Theme	Description	Question Answered	PMM Section
Policy, Administrative Standards and Manuals	Adhering to project governance identified in Polices, Administrative Standards and Manuals.	Who, What, Where, When and Why?	2.0 PM Governance
Business Case	Developing and managing the business case process that integrated with the Project Delivery process. How an idea with potential value for an organization is developed into a viable investment proposition, and how project management maintains the focus on the organization's objectives.	Why?	4.1 Acquire Approval 5.2 Plan Scope 7.1.1 Control Scope 8.1 Update Business Case
Project Organization	Providing project organization by structuring the project human resources with defining roles, responsibilities and authorities. The Project Sponsor allocates work to PMs, who steer the project to completion. The project organization addresses the roles, responsibilities, and authority of the project management team and specific stakeholder.	Who?	5.6 Plan Human Resources 5.7 Plan Communications 6.3 Manage Team 6.7 Manage Communications

Table 3-1: Project Management Framework Themes

PRINCE2 Theme	Description	Question Answered	PMM Section
Risk Management	Applying the risk management process throughout the project. Projects typically entail more risk than do stable operational activities. This theme addresses how project management manages the uncertainties in plans and in the wider project environment.	What if?	5.8 Plan Risk Management 7.3 Manage Risks
Quality Management	Providing formal Quality Management through quality assurance and control processes. Focuses on the quality attributes of the not only the products or service but the project management processes to ensure the product or service is delivered as defined.	What?	5.4.5 Plan Quality 6.6 Manage Quality 7.1.4 Control Quality
Plans and Progress Approval	Developing a process that identifies formal review and approve phase gates and reporting requirement. Projects proceed using a series of approved plans, which are the focus for communication and control. Addresses the ongoing viability of plans and is used to determine whether and how a project should proceed.	How? How much? When? Where are we now? Where are we going? Should we proceed?	4.1 Acquire Approval 5.0 Project Delivery Plan (entire section) 6.0 Project Execution 7.4 Report Performance 8.6 Update Business Case
Organizational Change Management	Providing a process to manage organizational change that is created with the initiation of a project and the ultimate delivery of the final product.	Who?	1.7 Organizational Change Management
Integrated Change Control	Providing a process to review, reject or approve changes to the project delivery plan and related project control documents. How project management assesses and addresses issues that may affect project plans and completed products. Issues may be unanticipated general problems, requests for change, or instances of quality failure.	What's the impact?	5.7.2 Define Performance Reports 7.0 Integrated Change Control (entire section)

4 Initiating Process Group

Initiating is the first of the five project management process groups. Like all process groups, it applies to each phase of a project life cycle, from project initiation through execution to project close. The initiating process defines the new project and its authorization, and similar initiating processes are carried out for the next project phases.



4.1 Acquire Project or Phase Approval

The PMM methodology includes the concept of phase approvals, with authorization from the previous project phase required prior to commencement of the subsequent phase. The process requires the PM to summarize the prior phase outputs and deliverable and identify potential changes to delivery.

4.1.1.1 How to Acquire Phase Gate Approval

The project initiation phase begins with Council approval of the project, which is normally the approval of the Capital Budget. In some instances, projects may be approved by Council in-year by approval of Administrative Report.

For subsequent project phases, the outcomes and deliverables are summarized by the PM and then reviewed and approved by the Project Sponsor prior to proceeding to the next project phase. The phase gate approval will be considered on the basis of these deliverables being approved. In situations where the project is not meeting the business case objectives, the Project Sponsor may request that the PM prepare a recovery plan to outline how to get the project back on track, prior to making the approval.

4.2 Identify Project Sponsor, Manager and Key Stakeholders

Identifying the Project Sponsor and PM is the first priority, since they will be responsible for project delivery. They will also execute the initiating phase processes, including defining the rest of the stakeholders.

4.2.1 Assign a Project Sponsor

All projects must have a Project Sponsor. The department responsible for the project budget is identified in the annual Capital Budget. The Department Head of that department is responsible for appointing a Project Sponsor. For example, if the Capital Budget identifies a Public Works budget account number for the project in the Capital Budget (#18XXXXXXX), the Director of Public Works is responsible for assigning a Project Sponsor to that project.

The Project Sponsor is the individual responsible to provide resources and support for delivery of the project within the business unit delivering the project. The Project Sponsor must be at a level in the business unit to address the type of issue that will occur based on the magnitude of the project.

The business owner (control & use owner) of the Investment which the project was created to delivery is a separate role in the project organizational structure. The business owner can be the project sponsor if the project is being initiated within the same business unit. Typically however, the business owner is from a different division within the same City Department or even different Department. See section 5.7 Plan Human Resources for details on the project organizational structure and responsibilities and authorities of both roles.

The Project Sponsor and business owner must be identified in the project and team charters, and their role and responsibilities must be defined in the PDP. The Project Sponsor is, at a minimum, expected to maintain awareness of the project, its progress, and its issues and to be available for participation in decision-making and dispute resolution.

4.2.1.1 How to Select and Assign a Project Sponsor

The department head responsible for project delivery organization selects a Project Sponsor appropriate for the magnitude of the project that is being delivered. The Sponsor will:

- Be at a level within the business unit delivering the project to provide resources, break down barriers and be the champion for the project.
- Provide the support necessary for the project to succeed and meet the business owner's requirements.

There are no specific rules for assigning the Project Sponsor. The Project Sponsor's formal commitment to the project is confirmed through endorsement of the project charter.

4.2.2 Assign a Project Manager

A PM is required at the beginning of the project initiation phase and continues in that role through the project close-out phase. The organization assigns a PM to deliver the project, as defined in the business case, with the expectation that the project objectives will be met.

The PM must have the necessary skills and qualifications to plan, manage, administer, coordinate, control, and report on the entire project life cycle, so the PM must have competencies appropriate for the size and nature of the project. Project risk implications, such as PM workload, should also be considered in PM selection, and, as with any risk areas, a risk response must be defined where warranted.

4.2.2.1 How to Select and Assign a Project Manager

Selection of a PM is the business unit's responsibility, with input from the Project Sponsor.

A PM requires knowledge of PM practices acquired through formal training, experience on similar types of projects, a track record of success, leadership skills, and strong planning, organizing, and communication traits are all useful for predicting good performance.

Expectations for the City's technical or business participation must also be considered when selecting the PM. If the City will provide quality assurance, a PM with knowledge of the product function, service, or operation will be an asset. If the vendor is responsible for the deliverable, however, a PM's product knowledge may not be an asset and may in fact make it difficult for the PM to abstain from contributing inappropriately. The business unit's ability to commit the PM's time to the project is critical; this ability must be ascertained before PM selection.

4.2.3 Determination of Committee Requirements

The requirement for a project to form a Committee will depend on both the risk and size of the project.

It should be noted that the decision making in this section is largely a continuation of the work performed in relation to Section 1.5 Documentation Requirements/Scaling of the PMM.

The guidelines below were developed considering impact on resources and cost benefit. As committees involve multiple individuals, there is a significant cost to establishment of committees. The major objective is to expend additional resources where there is significant risk or large dollar amounts at stake.

In determining the required level of documentation for the project, the PM will have made a determination as to both the project risk and project size. Guidance as to how to determine project risk and project size is contained in Section 1.5 of this manual.

All projects that are $10 million or greater require a Major Capital Steering Committee per Administrative Directive FM-004.

All projects that are high risk require a Project Advisory Committee. Large projects that are determined to be high or moderate risk require a Project Advisory Committee. Large projects that are low risk do not require a committee.

The following matrix summarizes the project's committee requirements based on project risk/project size.

Guidelines for Committee Requirements

		Project Size			
		Small	**Medium**	**Large**	**Major (XL)**
Project Risk	**High**	Project Advisory Committee	Project Advisory Committee	Project Advisory Committee	Major Capital Projects Steering Committee
	Moderate	None	None	Project Advisory Committee	Major Capital Projects Steering Committee
	Low	None	None	None	Major Capital Projects Steering Committee
		Below $1.0 million	**$1.0 million to $4.99 million**	**$5.0 million to $9.99 million**	**$10.0 million and above**

It should be noted that projects that are required to follow Full PDP must have a Committee. Projects that are required to follow the Short PDP have no Committee requirements.

4.2.3.1 How to Establish the Major Capital Project Steering Committee

The process for establishing the Major Capital Project Steering Committee is defined in Administrative Directive FM-004.

The department head for the department responsible for the project budget is responsible for establishing the Major Capital Project Committee in accordance with Administrative Directive FM-004. The Project Sponsor is the Chair of the Committee.

Due to the senior management representation on these committees, Major Capital Project Steering Committees provide direction to PMs.

4.2.4 Establish the Project Advisory Committee

The department head for the department responsible for the project budget is responsible for establishing the Project Advisory Committee.

The PM shall conduct the analysis as set out above to determine if there is a requirement for a Project Advisory Committee. If there is a requirement for a Project Advisory Committee, the PM shall advise the Project Sponsor of the requirement.

The Project Sponsor will be the chair of the committee and shall appoint a minimum of two other members of the committee. For clarity, the PM reports to the committee and is not a member of the committee. The Project Sponsor's appointments shall be approved by the department head responsible for the project budget.

These committees are advisory in nature and not intended to give direction to the PM on the project. The committee is meant to be an additional resource to the PM to aide in the successful delivery of the project.

4.2.5 Stakeholder Assessment

In addition to the major stakeholders already identified, all the other people and organizations affected by the project or who have an interest in the project must be identified. It is important to define the stakeholders early in the process and identify their interest and determine their level of participation, since the level of effort in interacting with stakeholders can vary widely and in some cases can be extensive. This process cannot be overemphasized through stakeholder assessment ensures that all perspectives are brought to the table. This improves the likelihood that a broad range of perspectives are addressed, that there is a positive attitude to decision outcomes and that as a result it is less likely to result in changes to project scope, schedule and costs.

For the Winnipeg Public Service, the number and types of stakeholders may vary widely according to the project type, and may include:

- Internal staff
- Operations and maintenance
- Regulators and other authorities
- Customers
- Vendors
- Special Interest Groups
- Members of the Public
- Utilities
- Biz Groups

4.2.5.1 How to Prepare a Stakeholder Assessment

A stakeholder assessment must be developed to record stakeholder interests and expectations and to define their importance and influence. This information is used to categorize stakeholders by potential impact on the project, and strategies are developed to minimize potential negative impacts and maximize positive impacts.

The stakeholder assessment is part of the project communication plan and public engagement plan. The assessment guides how project communication will be managed. As well, the assessment will be used on any Change Management activities occurring on the project and how public engagement activities are planned and executed.

See section 5.8 Plan Communication for additional information on Stakeholder assessment, Communication plan and Public Engagement.

4.2.5.2 Stakeholder Assessment Template

The Stakeholder Assessment template is part of the Stakeholder Assessment and Communication template provided in Appendix B.

4.2.6 Update Stakeholder Assessment

The Stakeholder Assessment is updated as the project progresses since new stakeholders may be identified who were previously unknown. The communication plan is reviewed at the same intervals for the same reason. New stakeholders and/or multiple parties not known at the outset of the project will require the communication plan to be updated.

4.3 Develop Project Charter

The project charter initiates the transition from the Pre-Project to Project Initiation phase. It formally authorizes the project to proceed and forms the agreement between the PM and the Project Sponsor. It functions like a work order by setting out the high-level expectations for delivery and commits the organization to providing the identified capital (and/or operating) budget, resources, and project support. The completed project charter provides a clear set of expectations for the PM and is used to develop the PDP, which is the baseline for monitoring progress and performance.

The project charter is developed from existing information, which may be known at the initiation phase only at a high level. At a minimum, the project charter should provide the following information:

- A project definition and estimated costs from the business case
- The approved capital (and/or operating) budget and any anticipated commitments, allowances, and contingencies identified

It is imperative that the project charter be endorsed by the Project Sponsor and the PM. After their agreement, the project charter provides the basis for the PM to develop the PDP.

A project may have more than one type of charter. The project charter documents the project as defined by the City and incorporates the project's scope of services. A teaming charter, as introduced in the *planning* process group, is produced to define internal team roles, responsibilities, and expectations. Consultants may produce additional teaming charters for their services, in which the City team may also participate.

4.3.1.1 How to Develop the Project Charter

The following items should be included when available:

1. Project Description
2. Project Deliverables
3. Out of Scope items
4. Schedule; Key Milestone Dates per Deliverable, if applicable
5. Project Budget
6. Establish the order of priority for the Project Scope, Cost and Schedule
7. Initial Requirements, Risk & Opportunities
8. Stakeholder Identification and Assessment
9. Change Management

Even though the project charter is much less detailed than a PDP, it helps to use the same structure for each, since the information in the project charter is carried forward to the PDP.

4.3.1.2 Endorse the Project Charter

The project charter gives the Project Sponsor's instructions for delivering the project to the PM, whose skills and expertise are used to develop the details, carry out the work, and fulfil the Project Sponsor's expectations. The Project Sponsor's endorsement of the project charter confirms the corporate/departmental expectations for the project and commits the resources needed for completion. The PM's endorsement of the project charter indicates understanding of the corporate expectations, the nature of the work, and the impediments to delivery, documented in the project charter (if any).

In many cases, the PM will have prepared the project charter and thus be able to endorse it with confidence. If not, the PM should be given time to review the project charter and potentially contribute to it to increase the project's chance of success.

Prior to finalizing the Project Charter, the Project Charter should be compared to the business case to ensure that the benefits identified in the business case are still there.

4.3.1.3 Project Charter Template

A template for the Project Charter is provided in Appendix B.

4.4 Starting a New Phase of the Project

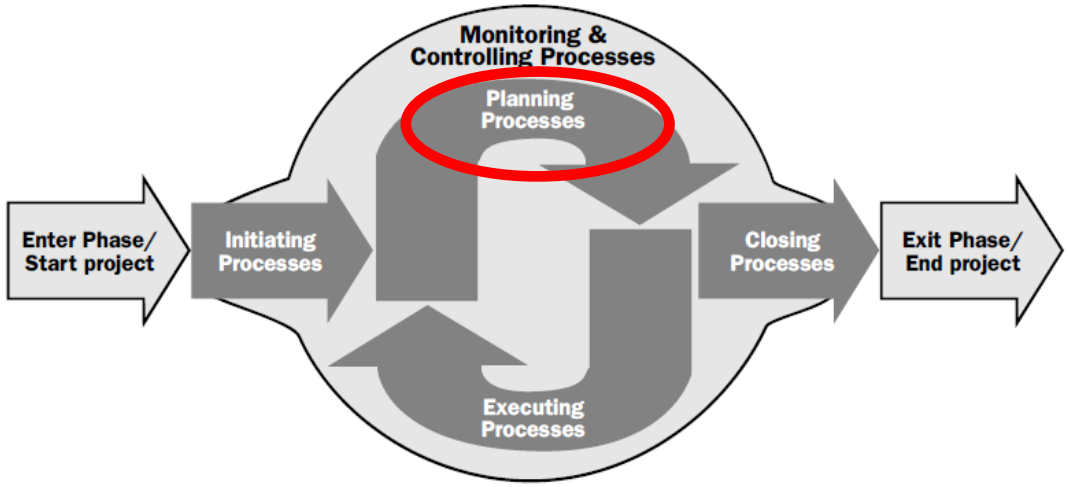
Prior to starting the next phase of the project, the following should be completed / in place.

- Project Sponsor in place
- Project Manager in place
- Committee (if required) appointed and in place
- Project Charter - completed and signed by the Project Sponsor and Project Manager
- Key Stake Holder Analysis completed

5 Planning Process Group

Planning is the second of the five project management process groups. Planning is a critical step in project delivery. While improper planning is the number one reason for poor performance, high-quality planning is the most effective way to increase the chance of exceeding expectations.

The PMM planning approach starts with the project charter and continues by developing project objectives and the delivery approach in more detail. Plans must be continually updated throughout the execution and close-out phases. Plans are also important as they provide the basis for monitoring and control.



5.1 Develop Project Delivery Plan (PDP)

The PDP is a comprehensive document that deals with all aspects of the delivery, including project management. The PDP is actually a compendium of a number of more specific plans. With the initial PDP, the PM presents their project understanding and approach to the Project Sponsor. By reviewing and approving the PDP, the Project Sponsor accepts the delivery approach and resource requirements. The Project Sponsor may reject all or parts of a PDP and request revisions for better alignment of resources with the business case. After approval, the PDP becomes the roadmap for carrying out, monitoring, controlling, and reporting on the work.

The PDP applies to two project delivery approaches, either Consultant or in-house-delivered. In either case the PDP covers the City's project planning.

With the consultant-delivered approach, the Consultant has a subproject within the City's project. The City's PDP defines the nature and extent of the consultant's services, however the Consultant provides the details of the product planning and associated project management in a project execution plan (PXP), which complements the PDP.

With the in-house-delivered approach, the PDP includes product planning and delivery details.

5.1.1.1 How to Prepare a Project Delivery Plan

The PDP provides the PM, project delivery team, Project Sponsor, and stakeholders a common understanding of the work plan and planning requirements throughout the project. The PDP should include detailed plans for the following:

- Scope
- Financials (budget and cost per deliverable)
- Schedule (including identification of the critical path)
- Quality
- Procurement
- Human & other Material Resources
- Stakeholder Assessment and Communications (Public Engagement)
- Risks
- Requirements Management
- Integrated Change Control
- Health, Safety, Security, and Environment (HSSE)
- Commissioning
- Close-Out

The PDP is constructed by developing project-specific information for each of the project management plans. It provides the baselines that are used for monitoring and controlling the project.

5.1.1.2 Project Delivery Plan Template

A template for the Project Delivery Plan is provided in Appendix B.

5.2 Plan Scope

5.2.1 Define Scope

The PM is responsible for developing details of the scope defined in the business case and project charter. As noted in Section 4.3, the project charter describes the product, service, or result to be delivered, and may identify key project objectives and deliverables. Further development includes identification of the delivery approach, project implementation phases, and support service requirements.

All project definitions begin with a scope statement. The scope statement is an overview that describes the project and its product. It provides a common understanding of what is included and what is not included in the project.

5.2.1.1 How to Develop a Scope Statement

The Project Sponsor, Project Advisory Committee, and other relevant stakeholders should be involved in developing the scope. Often the author of the business case and members of the project delivery team are involved, or at least to review the draft scope statement.

Since the sole purpose of the project is to meet the needs expressed in the business case, the scope statement must be consistent with the business case. The scope statement should be a narrative describing the scope and its deliverables, and should provide any needed clarifications, including:

- Out-of-Scope Work or Deliverables
- Constraints
- Assumptions

- Acceptance Criteria

The scope statement must have sufficient detail and clarity to be used as a metric for performance reporting. It is usually based on levels of service and defined in terms of products or services. If the deliverables change during the project, a review using the change control process is warranted.

5.2.2 Gather Requirements (Future)

5.2.3 Work Planning

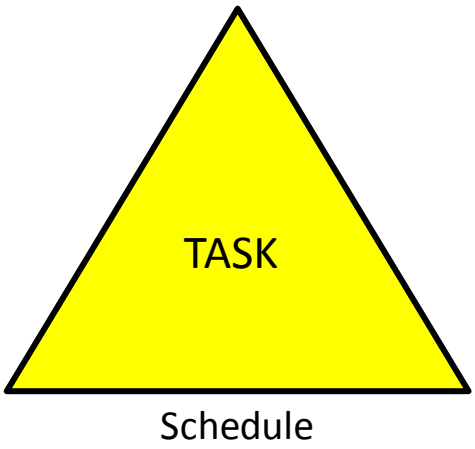
Work planning involves development of a number of project management and product work plans for a defined scope. The work plan is a collection of all the project components, arranged according to a work breakdown structure (WBS; refer to Section 5.2.4). The work planning process requires hands on effort by the PM, expert judgement and preferably with the input from an experienced team.

A commonly used project planning tool is Microsoft Project (MS Project). The intent is for MS Project to be applied to PMBOK based PMM processes and procedures. In general this can occur seamlessly. However, one of the cases where MS Project cannot be modified to match terminology from PMBOK, is with the use of the term “task”.

For MS Project the task can refer to Phases or Deliverables or Work Packages. Each Phase can be broken down to Deliverables, a Deliverable to Work Packages and so on.

The tasks or activity for each deliverable will have (1) a work description, which defines the effort required for specific outcomes or deliverables, (2) resources (people and time) required, and (3) a schedule. Each of these three parts is essential for effective planning, monitoring, and controlling of projects. A change to any one of these will result in a change in one or both of the others. The three parts are integrated in the project management approach shown in Figure 5-1.

Figure 5-1: Task Components Integrated into the Project Management Approach



5.2.4 Create a Work Breakdown Structure (WBS)

The WBS is a deliverable-oriented representation of the work. It presents a hierarchal view of the project comprising the total project as defined in the scope statement. The WBS subdivides the project into smaller packages for effective planning, management and delivery of the work. It defines in explicit terms no only

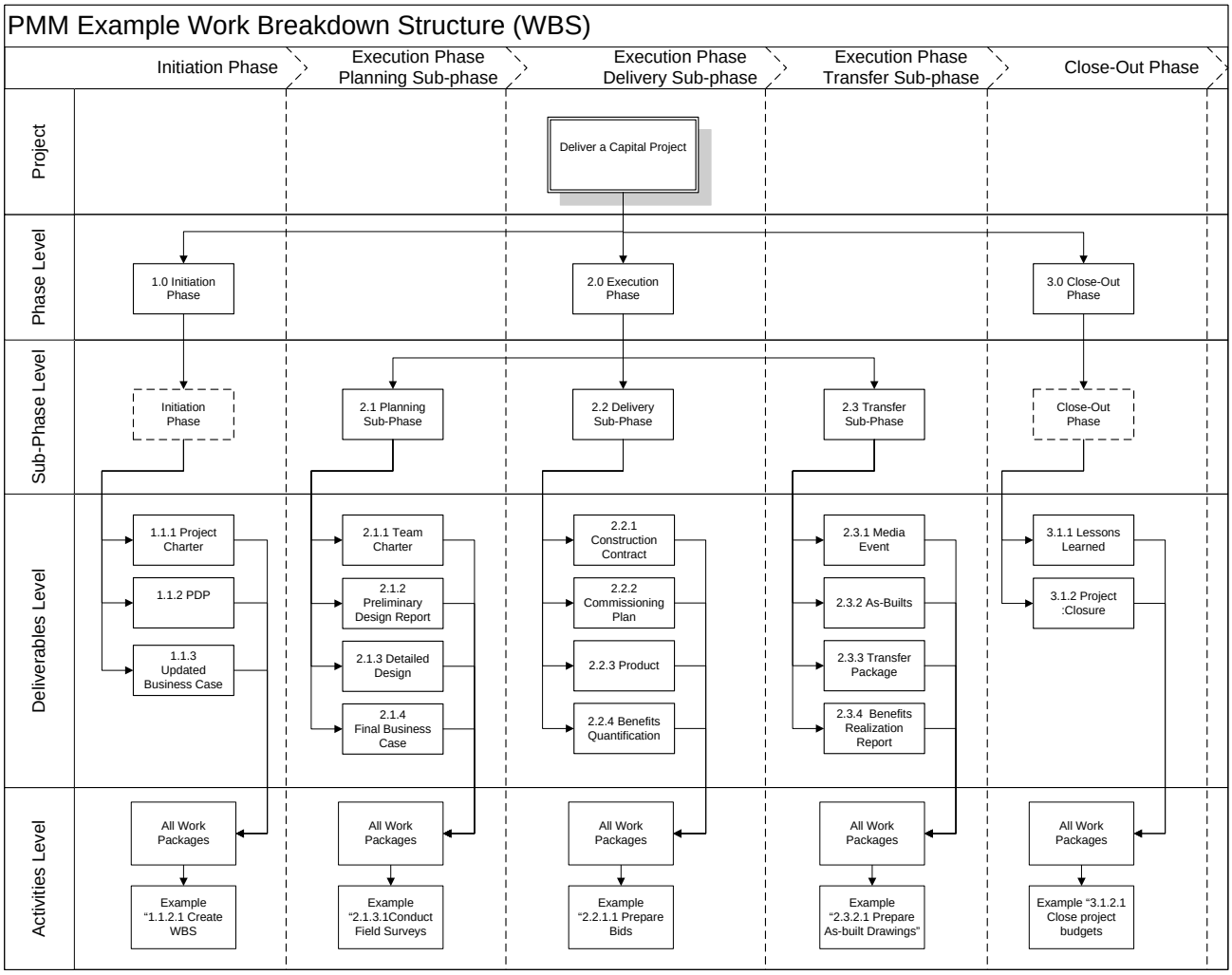
what deliverables the customer/stakeholder will get when the project is complete however also the specific project deliverables that are produced for the project itself, i.e. a PDP. All projects should have a WBS.

Creating a WBS is the process of subdividing the deliverables and project work into increasingly smaller and more manageable components. Work packages are at the lowest level and are defined such that they can be scheduled, estimated, monitored and controlled.

The WBS provides the formal record of deliverables and associated costs. Deliverables for a project are fixed and can only be changed through the change control process. Activities on the other hand are what is required to produce the deliverables, and within limits can change during the delivery of the work.

Various layouts are commonly used for the WBS. Selection depends on the type and nature of the project with the level of detail being based on the complexity of the project. The PMM structure for project delivery aligns with the Project Delivery framework as presented in Figure 3-2. It includes the project at the top level followed by project phases at the next level. Specific project or product deliverables are at subordinate levels, and work packages at the lowest level as illustrated in Figure 5.2.

Figure 5-2: A WBS Tree Structure Organized by Project Phases



The "Deliver a Capital Project" example in the figure is for a typical DBB project. The example has been prepared for illustration and explanation purposes; it is not intended to be complete and the illustration includes features not normally shown on a WBS:

- Swim lanes for project phases and the vertical bars for project phases have been included for clarity.
- The deliverables are shown in a vertical orientation to accommodate the page size.
- The activities are not detailed however just shown on the figure as placeholders.

The significant features of the WBS are as follows:

- **Project Level:** The top level of the WBS is the project itself, often referred to as “Level 0”.
- **Phase Level:** The levels immediately below the project are the project phases. The Project Delivery framework includes three top level project phases.
- **Sub-Phase Level:** The execution phase for the Project Delivery framework is further subdivided into three sub-phases. The actual number of phases and sub-phases in the WBS will depend on the project requirements.
  - The use of phases and sub-phases must accommodate phase gates.
  - In some cases additional sub-phases may be required for intermediate cost estimates, project reviews and decision making, as described subsequently in Section 5.2.4.2.
- **Deliverable Level:** The deliverable level must include all project and product/service deliverables so that nothing is omitted.
  - The deliverables must be tangible items that can be quantified when delivered. Not task activities.
  - The degree of breakdown and size of the end packages may vary by project size and type.
  - More than one level of deliverables may be used. That is, a large deliverable may be broken down into more deliverables.
  - The critical feature is that all deliverables must be included.
- **Activities Level:** The activities are not know for each deliverable at the early stage of the project and therefore are not included, unless known. The activities are the detailed steps necessary to complete the deliverable as defined. The activities may be in terms of the work to be done for the deliverables, or in terms of defined work packages. All of the activities must roll up to a deliverable.

Rolling Wave Planning Technique: The refinement of the work breakdown structure occurs progressively in each phase, which is known as the Rolling Wave Planning technique.

In the example, the Consultant and Contract sub-projects have been included at the highest level in the early stage of the project and will be broken down into more refined deliverables and activities as the project progress.

The Rolling Wave often results in the earlier phase WBS having less detail than the WBS in the later phases, specifically at the activity level.

The 100% percent rule applies to each phase and level of the WBS:

- Each level of the WBS must include all of the work.
- Each of the levels in a project phase must include all the deliverables necessary to complete the project.
- With reference to Figure 5-2, just as the top level encompasses the entire project, so does every level below it.
- Because of the 100% rule, the total project cost at the top level will be equal to the sum of the phases, the sum of the deliverables, and the sum of the activities. This allows the WBS to be either broken down or rolled-up by each phase to any selected level.

The WBS is a building block for further project definition. It provides the structure for developing the basis of estimate and the schedule.

5.2.4.1 How to Create a Work Breakdown Structure (WBS)

A WBS is developed by subdividing the work described in the scope statement into successively smaller components (deliverables) until each is in a manageable work package.

The steps for development of a WBS are:

1. **Identify deliverables** – The WBS is a deliverable-oriented representation of the work, and as such must encompass all project and product deliverables. The first step is to identify and analyze the project and product deliverables and related work, and then determine what activities are needed. The project management deliverables will be as defined in the PDP and tailored for the project. These include tangible deliverables such the PDP itself. The PDP may be further broken down into its components such as the project charter, risk assessment, requirements specification, etc., or they may be included as part of the PDP. The critical requirement is that all deliverables must be included. The deliverables must also include the main product deliverables which may be capital assets, a result, or a service and will be known from the project charter and scope statement. For the first version of the WBS these may be defined at a high level and later broken down to greater levels of detail through the Rolling Wave process.

2. **Create the WBS structure** – The WBS is to be organized in a tree structure as illustrated in 5-2. Use of the tree structure permits the lower levels to be rolled up to the higher levels, with the complete rollup encompassing the entire project.

   The project title is placed at the top level, with the project phases (initiation, execution, and close-out) as defined in the Project Delivery framework (Figure 3-2) on the second level. The subsequent phases will depend on the project requirements, and may be subdivided into the three standard project phases on the third level (planning, delivery, and transfer) or even further.

   Project specific deliverables are to be included under each project phase or branch of the tree. The level of detail for deliverables must be selected to suit the project size and complexity. For large projects there may be two or more levels for deliverables, with increasing levels of detail.

   It is critical that the deliverables be defined as tangible products, results or services that will be created or produced by the project and not work activities or effort to produce them. As a result the deliverables are always defined as a noun.

   The activities taken to create or produce the deliverables are included in the WBS level below the deliverables. They are defined as the direct activities needed to produce the deliverables, or are work packages describing a sequence of actions or steps to produce the deliverables. The activities must all roll up to deliverables.

3. **Defining Work Packages -** The extent of the work breakdown for the activities depends on the granularity required for delivery and management of the project. As a guide, a work package is small enough when it can be estimated for work effort, cost, and time. The breakdown should not proceed to the point where it becomes overly restrictive or causes excessive effort to manage.

4. **Identify WBS names and WBS codes** – An outline naming and numbering scheme is required for the WBS. For WBS numbering the project level is typically considered to be “Level 0” with the subordinate levels numbered sequentially. Note: in MS Project there are two options, “Outline” numbers or WBS codes.

The WBS structure can be listed in an outline view as shown in Table 5-1. This results in the complete WBS sequenced by phase.

The outline view for the WBS is the most useful and practical method of presenting the WBS. While the tree approach provides a good illustration, it is not easy to integrate with the WBS dictionary, schedule and resource matrix.

Table 5-1: WBS Outline View for "Deliver a Capital Project" Example

Project	Deliver a Capital Project
1.0	**Initiation Phase**
1.1	Initiation Phase *(intentional duplicate)*
1.1.1	Project Charter
1.1.1.1	Develop Project Charter
1.1.1.2	Endorse Project Charter
1.1.2	Project Delivery Plan
1.1.2.1	Define Scope
1.1.2.2	Create WBS
1.1.2.3	Determine Budget
1.1.2.4	Prepare Schedule
1.1.2.5	Plan Procurements
1.1.2.6	Plan Communications
1.1.2.7	Approve Project Delivery Plan
1.1.2.8	Initiation Phase Closure
1.1.3	Updated Business Case
1.1.3.1	Update Business Case
1.1.3.2	Acquire Phase Approval
2.0	**Execution Phase**
2.1	Planning Sub-Phase
2.1.1	Team Charter
2.1.1.1	*List Team Charter Activities*
	etc.
3.0	**Close-Out Phase**
	etc.

The outline numbering can be structured to best facilitate execution of the project. If MS Project is to be used it is desirable to assign the items in each WBS level at the same hierarchy in the numbering. By doing this similar types of information will be displayed when sorting by outline levels in the software. For the above example this would require the insertion of item "1.1 Initiation" which would be a placeholder and a repetition of the Initiation phase item.

5.2.4.2 How to Select Delivery Sub-Phases

The standard project phases may be subdivided to accommodate complex projects. For example, a project such as the South End Water Pollution Control Centre upgrade may include multiple design delivery phases, such as conceptual, functional, preliminary and detailed design. Conversely, a one-block water main or street renewal project may require only preliminary and detailed design.

These sub-phases may be used to identify discrete review points (stage gates). A common practice is to provide cost estimates and technical review of products at the end of these various phases.

Preliminary Design

The City's Definition of Standard Consulting Engineering Services defines "preliminary design" as a prelude to detailed design. Preliminary design includes:

- Preliminary engineering studies
- Surface and subsurface site explorations, measurements, investigations, and surveys
- Operations studies including drainage and traffic studies
- Functional planning
- Physical, economic (capital and operating), and environmental studies including evaluation, comparison, and recommendation of alternative preliminary designs
- Development and submission of a report and appropriate drawings documenting data gathered, explaining the assessment made, and stating the resulting conclusions; the report must contain all recommendations relevant to this stage of the project
- Special applications to public agencies for necessary authorizations, preparation and submission of reports and drawings, and appearance in support of the application

The Association of Professional Engineers and Geoscientists of the Province of Manitoba (APEGM) guide for engaging a consulting professional engineer uses the term "pre-design" rather than preliminary design. Both terms refer to what has to be done before final engineering services may begin; that is, both terms encompass the design activities carried out prior to detailed design. This work is largely investigative and subject to variation. Examples of work in this category are given on the APEGM website at http://www.apegm.mb.ca/FindingAConsultant.html.

Conceptual Design

Preliminary design is often broken into conceptual and functional design in large and complex projects. Conceptual design is often referred to in the scope of work and Consultant proposals for these projects.

Conceptual design, as the name implies, deals with operational concepts. For complex projects such as a wastewater treatment plant, conceptual design deals with the types of processes to be used, their major components, and the interactions among the processes. "Conceptual design" may also relate to a level of progress in an engineering study. This is of practical value when the level of effort relates to a desired precision for the cost estimate.

Functional Design

Functional design, like conceptual design, is used for large and complex projects. The term has various definitions, depending on the circumstances and the need to break down the WBS into smaller phases.

As with conceptual design, functional design can be used to define a level of design completion and is related to a specific cost estimate classification. For complex projects, such as a Wastewater Treatment Plant, the functional design is based on completion of process and instrumentation diagrams (P&IDs). The process flows and controls are known at this stage, which results in a more refined deliverable or product and therefore a more accurate cost estimate can be determined.

Detailed Design

Detailed design includes preparation of the detailed engineering designs, drawings, specifications, and bid opportunity for the work to be constructed. The City's expectation is for the design referenced in the bid document to be prepared to a Class 1 estimate.

5.2.5 Develop a Work Breakdown Structure (WBS) Dictionary

The WBS dictionary is an output of the create WBS process. It is a document or spreadsheet that provides more detailed descriptions of the WBS components, including work packages and control accounts. The descriptions support development of the delivery schedule and estimation of the resources required to complete the work.

5.2.5.1 How to Develop a WBS Dictionary

The WBS dictionary should be developed based on the project complexity. An example is given in Table 5-2. The information must include the WBS name and number and the WBS code so that it can be related to the schedule and budget. Additional information as determined by the Project Manager may be included or referenced.

Table 5-2: Sample WBS Dictionary

WBS Dictionary	
Project Name: Deliver a Capital Project	
Deliverable: 1.1.1 Project Charter	
Work Package ID: 1.1.1.1	**Account Code:** XX-XXXXXX
Work Package Name: Develop Project Charter	
Description of Work: Develop a Project Charter based on PMM procedure Section 4.3.1.1	
Assumptions:	
Assigned to:	**Date assigned:**
Estimated cost:	**Due Date:**
Resources:	

5.2.6 PDP and PXP Relationship

If the project is to be consultant-delivered, the Consultant will develop a detailed PXP (consultant delivered project delivery plan) with a WBS, schedule, and task descriptions for their specified deliverables based on the PMM. The City's PDP will identify the Consultant's deliverables (i.e. preliminary design report) the City's deliverable and tasks associated with each Consultant deliverable: i.e. Consultant contract (deliverable): soliciting, awarding, and contract administration (activities).

5.3 Plan Financials

5.3.1 Determine Budget

The total funds authorized to execute the project is termed the "budget." The budget is critical for work planning, progress and performance reporting. All business cases proceeding to implementation are accompanied by an approved budget, which cannot be changed without further formal approval.

For total cost accounting, all internal costs for delivery of the project are included in the budget. However, the City does not always use total cost accounting, and often projects span multiple budgets, so the PM must account for which costs are allocated to the project budget and which are funded from separate accounts.

The budget will be set based on compilation of cost estimates developed at the pre-project phase, and may be updated based on revised estimates during subsequent project phases. Often the business case will have

been developed from projection of historical costs or from parametric costs with a low level of accuracy however with a compensating contingency allowance. Updated estimates at subsequent phases must be compared to the budget as the project proceeds. Phase gates are the formal points for review and comparison of updated estimates with the budget.

5.3.1.1 How to Determine Budget

The initial budget is provided to the PM at the outset from the Business Case, prior to the process for developing the project charter. This is the first opportunity for the PM to flag issues prior to acceptance and buy-in. The PM must review the budget and request any necessary clarifications to confirm or identify necessary changes to the budget.

Determining a budget involves aggregating the expected cost estimates for individual deliverables and any other project cost components to establish a total cost.

The cost estimates typically include the following components of a project:

- Project Management
- Consultant or in-house engineering (in some cases, Team Members Salaries)
- Construction
- Operational costs – See below for details
- Third-party involvement
- Overheads (Finance and Admin) – See below for details
- Contingencies
- Inflation
- Other costs and fees

Finance and Administration Charges

With some specific projects, the City makes a major investment outside of normal budget categories. The City recoups these costs through finance and administration charges to the project.

Administration charges of 1 percent to a maximum capital value of $100,000 are applied to the capital budget to recover the City's internal administrative costs for expenses such as making awards, preparing contracts, and providing associated legal services.

Interest is charged at a rate of 2 percent to the capital budget to reimburse the operating budget for interim financing. Interim financing includes the City's share of the funding and debt charges and all other costs except for salaries, Consultant fees, and legal fees. Interest is not applied to external funding, such as grants.

Operations Cost

The business case considers the asset life cycle, with operational costs forming a major component. Project delivery does not directly address operating costs; however, when the capital program changes, operating costs may change and must be updated in the business case, operating and project budgets.

Estimates roll—up to the Deliverable level per the WBS

The above cost estimates roll-up to the each project deliver able to facilitate consistent project reporting and the monitoring and tracking of progress, generally:

- Costs internal to the City and assigned to external parties need to be assigned to each deliverable.
- Consulting and construction contracts will have separate estimates and need to be assigned to each deliverable.
- Management reserves and risk reserve contingencies are managed as separate line items.

Project costs are continually forecast and compared with the base line estimates and the project budget during project execution, which may lead to the need to transfer of funds between line items or the need to obtain additional budget funds or a reduction of budget funds!

5.3.2 Estimate Costs

Estimating costs is the process of developing an approximate value of the monetary value needed to complete the project component. The initial cost estimate is provided from the Business Case (from the pre-project phase) and updated by the PM based on development of the PDP. As the project proceeds and additional information becomes available the PM will also be responsible for developing, updating, compiling and reporting a number of intermediate cost estimate updates at different phases of the project for input to approval processes.

The cost estimate accuracy increases through the project life-cycle as the information on the product becomes more defined. At the early stages of a project the level of accuracy is the least and the cost uncertainty is the highest. The cost classification system attempts to improve communication among stakeholders and reduce the misunderstanding of what they represent.

5.3.2.1 How to Classify Costs

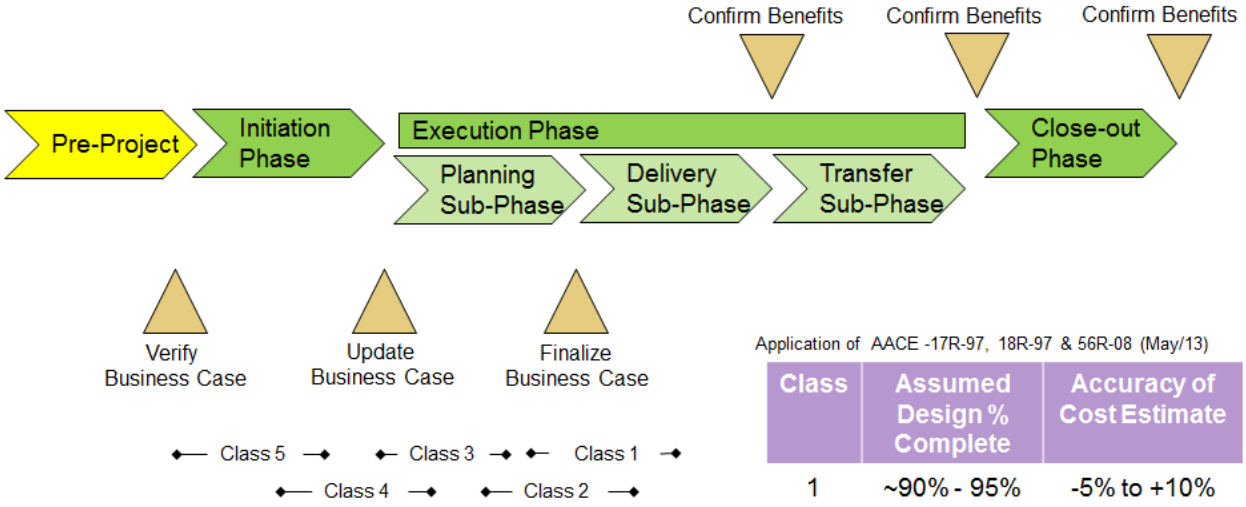
The City has adopted the Association for the Advancement of Cost Engineering (AACE International) cost estimate classification system as the de facto standard. This classification system has reasonably broad acceptance within engineering and construction communities. The classification system maps cost estimating accuracy to the phases of project completion, or degree of project definition.

The primary characteristic used to define the classification category is the level of project definition. A “countdown” approach using five categories is used labeled Class 5 through 1, with 5 being the lowest level of project definition, having for example only between 0 and 2 percent of engineering being complete.

The classification system relates a level of accuracy to the estimate, expressed as an over or under (+/-) percentage that decreases in value as the project progresses. An accuracy of +100/-50 percent means that the real value could reasonably end up as high as double (i.e. 100% of initial + 100% of increase = 200% of initial), or as low as half of the expected value. As an example, an estimate of $500,000 could be as high as $1,000,000, or as low as $250,000. Unlike contingency, the accuracy estimate is not added to the estimate, however used to demonstrate the potential range. It is also a factor for consideration in setting the contingency allowance.

Application of the classification system to the Project Delivery framework (Figure 3-2) is shown in Figure 5-3. At the pre-project phase the cost estimates is likely to be Class 5, and with the progressive refinement in project scope the accuracy increases as the project proceeds.

Figure 5-3: Project Delivery Cost Classification System



Application of AACE -17R-97, 18R-97 & 56R-08 (May/13)

Class	Assumed Design % Complete	Accuracy of Cost Estimate
1	~90% - 95%	-5% to +10%
2	~60%	-10% to +20%
3	~30%	-20% to +30%
4	~10%	-30% to +60%
5	~1%	-50% to +100%

COST CLASSIFICATION RELATED TO PROJECT DEFINITION

ESTIMATE CLASSIFICATION*	PROJECT DEFINITION	DESIGN % COMPLETE	ACCURACY OF COST ESTIMATE
Class 1	Detail Design Drawing and Specification Complete, Pre-Tender Estimate	~90% - 95%	-5% to +10%
Class 2	Design Development in progress	~60%	-10% to +20%
Class 3	Preliminary Design for Budget Authorization	~30%	-20% to +30%
Class 4	Feasibility Study	~10%	-30% to +60%
Class 5	Concept Screening, Rough Order of Magnitude Estimate	~1%	-50% to +100%

COST ESTIMATE CLASS DESCRIPTIONS

- Class 1 - Estimates prepared based on completed detail design documentation (plans and specifications) as well as complete project delivery plans. At pre-tender estimate stage.
- Class 2 - Estimates prepared in progressive detail from a class 3 and are used to establish a contract value against which decisions can be made to revise the scope of the project and manage risk at a specific milestone in the design development.
- Class 3 - Estimates based on completed preliminary design documentation. This Class 3 estimate will form the basis for budget authorization and set initial control estimate against which project deliverables will be measured (i.e. on budget).
- Class 4 - Estimates prepared based on limited information with some engineering work completed and preliminary scope determination.
- Class 5 - Rough estimate prepared based on very limited information with no engineering work completed. Used to make an assessment of initial viability and for long range capital planning.

5.3.2.2 How to Estimate Costs

Cost estimates are required for each component of the project.

A Basis of Estimate (BOE) template is being developed to standardize the way estimates are developed and presented.

The WBS provides the structure for cost estimates. All costs must relate to specific deliverables in the WBS. A well-developed WBS with all deliverables identified and activities defined for their delivery provides the basis for the project and product costs.

Project Management Costs

Project management costs are those associated with running the project. Costs are developed through bottom-up estimating for each deliverable detailed in the WBS. The resource matrix which relates the number of hours for each individual and their billing rate to the tasks described in Section 5.6 is used for this purpose. It includes a table with personnel and their estimated time commitments for each task. The estimating process takes the following steps:

1. Assign a labour rate to each individual, including a percentage for benefits (~2014-19%)
2. Multiply the labour rate by the number of task hours for each individual.
3. Total the values for the entire project.
4. Add any additional project expenses for materials, equipment, and incidentals.

The task costs then may be rolled up from the deliverables to higher levels of the WBS. Rolling the costs up to the top level for every deliverable provides the total cost for the project.

A number of internal services and expenses identified in the PDP may not be allocated to the project budget. These may include internal support staff time, office overhead, etc., or in some cases the PM time may even be allocated to a non-project budget. While it is important to identify them, they must be considered separately for comparing the cost estimates with the budget. In the future, the City may track and record all capital-project-related costs, however systems for this are not yet in place.

Consulting Service Fees

Consulting services, such as those for engineering consultants, relate to specific deliverables(s) defined in the WBS. Consultants will track and submit costs to these identified deliverables in order that costs can be managed per the change control process.

Product Cost

For the initial PDP, the PM should start with the costs presented in the most current business case and update as required. As the project is now live, the PM should be performing additional due diligence/taking a deeper dive into cost estimates. If the PM has access to or knowledge of additional information, such as more relevant estimating tables, or experience from previous projects for cross-checking the costs, the PM should include the additional information to increase the accuracy of the delivery plan.

Product costs are then developed and refined as part of the project execution. For large projects, the product cost is typically the largest cost component of the project and development of the costs should be appropriate based on the project's' complexity.

In many cases qualified estimators or quantity surveyors are required to perform this function.

Other Incidental Costs and Fees

Other incidental costs and fees must be identified and updated. If not specifically detailed, they may be accounted for in an all-inclusive capital cost estimate or considered as part of a contingency allowance. Identifying and tracking incidental costs and fees on an individual basis becomes more important as the project becomes more defined. Potential costs in this category include:

- Costs from other levels of government and authorities for permits, inspections, and approvals
- Third-party costs for specialist inspections, miscellaneous work, and services
- Regulatory and intervener costs for which special approvals are required
- Utility services and upgrades
- Public open houses and official openings for public programs
- Commissioning costs and customized manuals
- Operating costs during commissioning and start-up
- Use of temporary facilities and equipment
- Training costs
- Inflation
- Overhead
- Taxes

Cost Escalation

Inflation is a universal cost category that requires special attention. The estimating process must identify how inflation has been or will be addressed and managed. The most conservative approach is to assume inflation rates are applicable and then apply them on an annual basis to each of the component estimates. This requires that the schedules be defined and that this method be permitted in the budgeting process. Using a transparent method like this allows for proper monitoring and addressing unanticipated marketplace fluctuations.

Contingency Allowances

Contingency allowances are added to estimates to account for project uncertainty (risk) that could have a financial impact. Risks and consequently contingency allowances are generally higher at the early stages of a project and are reduced or eliminated as more precise information becomes available.

A variety of contingency allowances are used for different purposes at different points in the project, as shown in Table 5-3.

Table 5-3: Types of Contingency Allowances

Contingency Allowance	Cost Risk Type	Purpose	Owner	Value	Updating	Release
Estimating Contingency	(Known-unknown)	Accounts for imprecise knowledge of product details	PM	Varies with the level of cost estimate	Updated at milestones, such as conceptual or detailed design	The size of the contingency decreases during the project life cycle and is eliminated or replaced by the capital cost allowance upon construction award

Table 5-3: Types of Contingency Allowances

Contingency Allowance	Cost Risk Type	Purpose	Owner	Value	Updating	Release
Risk Reserve	(Known-unknown; should be identified in the business case; if not, they are unknown-unknown)	For response to realized risk events	PM	Determined through risk analysis, and set based on risks and risk tolerance	Continually monitored and adjusted as risks change	Formal process for release if risk is realized; surplus funds are retired after the risk has been eliminated
Capital Cost Allowance	(Unknown-known)	Accommodates routine changes during execution	PM and Project Sponsor	Usually set at a fixed percentage, such as 5%	Only changed by exception	The allowance is drawn down by issuing change orders
Management Reserve	(Unknown-unknown)	For expenses outside of formal project delivery	Project Sponsor (Senior Management – Director)	Varies	Varies	Upon authorization of the Project Sponsor

As Table 5-3 shows, the type of risk may be known or unknown, and a risk's extent and consequences may be known or unknown, which yields the following combinations:

- Known-unknown – The risk has been identified, however whether it will actually occur and, if it does, to what extent, is unknown. Knowing what the risk could be allows a rough estimate of the consequence to be made. An example is the effect of inflation on input costs due to global economy fluctuations.
- Unknown-unknown – Neither the risk nor its extent and consequences are known in advance. An example is encountering archaeological ruins in an excavation.
- Unknown-known – The particular risk has not been identified, however the general risk is expected to occur to a predictable extent with known consequences. An example of this is cumulative minor changes in a construction project.

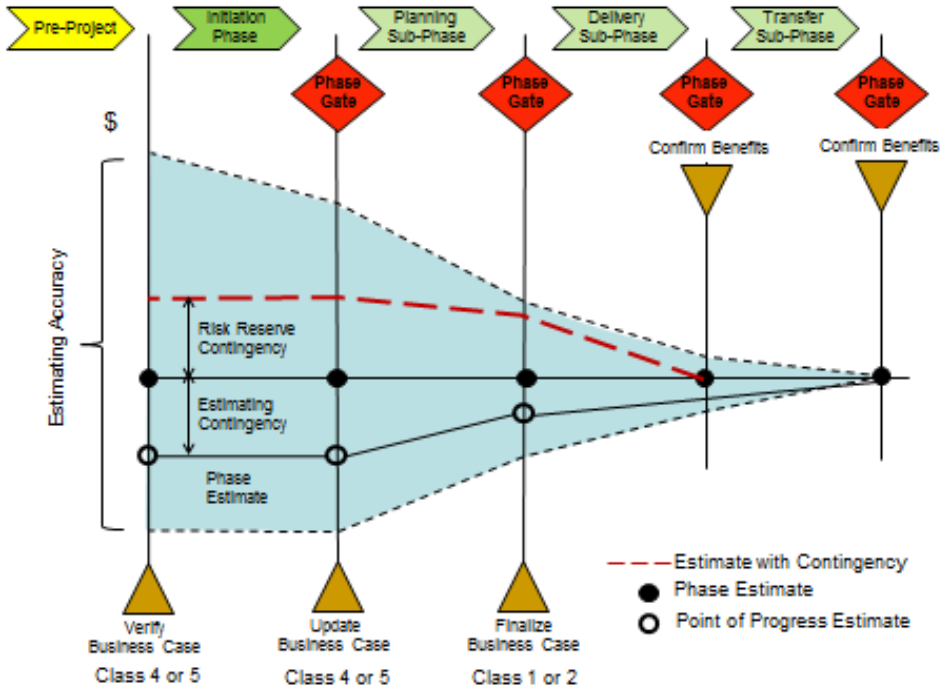
Proper application, management and control of contingencies require that they have definitions and rules for how the values are determined, who owns them, how they are released, and how they are retired. The method of determining and applying contingency allowances is included in the following section. The method of identifying and quantifying project-specific risks that affect risk reserve contingency values is described in Section 5.9 and the process for tracking and managing contingency allowances are described in Section 7.3.

5.3.2.3 How to Apply Contingency Allowances

A fundamental issue that the PM must deal with is whether the project budget is sufficient to complete the project. Contingency allowances may be added to estimates to address various types of uncertainty and risks to improve the chances of the project being within budget, however they must not be applied to the point where the additional commitment will encumber funds that could otherwise be put to productive use or negatively impact the project's business case.

The use of contingency allowances as they apply through the project life-cycle is illustrated in Figure 5-4.

Figure 5-4: Application of Contingency Allowances through Project Phases



The estimating contingency, capital cost allowance, risk reserve contingency and management reserve are applied to the project estimates at the project phases as follows:

Estimating Contingency: At the early phases of a project, the product cost estimate will be based on a limited amount of information, a low degree of project development and will have a high degree of uncertainly. It is generally accepted that a number of factors (known-unknowns) will cause the subsequent estimates to increase and therefore an estimating contingency is added to the phase estimate to account for the expected increases. The value of the contingency depends on the nature of the product and the level of project development. The estimating contingency is maintained through the project phases at diminishing values in general proportion to the estimating accuracy until a fixed value is received for the product.

Capital Cost Allowance: When a project proceeds to the delivery phase, a bid for the product is received which in effect eliminates the estimating risk because a price is received which provides a level of cost certainty. The estimating contingency then in effect is converted to a capital cost allowance to address the unknown-known items of the delivery phase. The capital cost allowance is released during the execution based on the Change Control process or retired at the end of the delivery phase. There is no fixed rule for its quantification, however a value of five percent is common based on industry practices and precedence for most major projects.

Risk Reserve Contingency: The risk reserve is a contingency added to the phase estimates to improve the chances that the project will remain within budget. The risk reserve addresses both systemic and project specific risks and is quantified through the risk management process as described in Section 5.8. The risk reserve addresses the following:

- Risks that are to be accepted or are to be managed through a defined contingency allowance response will increase the required amount of the risk reserve contingency
- Risks not to be included in the risk reserve include:
  - Extraordinary events such as extreme weather, earthquakes, riots, acts of war, new government regulations, major strikes

- Major scope changes such as changes in product specifications, building sizes, etc. This risk should be eliminated early in the process through stakeholder requirements gathering.

Management Reserve: Management reserve is a provision held by the Project Sponsor for possible changes in project scope, extraordinary risks, and unforeseen external risks. Because of its nature and variability between projects, there is no industry practice or standard recommended for its quantification.

There are several methods available for quantification of contingency amounts. Selection of the method will depend on the type of contingency under consideration and nature of the project.

5.3.3 Prepare Basis of Estimate (BOE)

AACE recommends that a basis of estimate document be prepared as a deliverable to accompany the cost estimate. The BOE should clearly and concisely indicate the purpose and scope of the estimate, pricing basis, methodology, allowances, and classification of estimate, other assumptions and any deviations from standard practices. In addition to providing the background for development of the cost estimate it is intended to support review and validation of the estimate.

5.3.3.1 How to Prepare BOE

The BOE is to accompany and be a component of the cost estimate. The basic BOE shall include:

- Project
- Estimator(s)
- Description of the estimate
- Reference to the WBS deliverable
- Estimating methodology and cost basis
- Assumptions
- Classification of estimate
- Basis for contingency and allowances

5.3.3.2 Basis of Estimate Template

A template for the Basis of Estimate is provided in Appendix B.

5.3.4 Cost Sharing Projects (Future)

5.4 Plan Schedule

Scheduling is one of the three interconnected project components, as discussed in Section 5.1.1. Every project must have at least one schedule. The schedule developed by the PM at the outset of the project and reported in the PDP is the master schedule for the entire delivery chain and encompasses all the project components whether in detail or rolled up. It must commence from the date the project charter is approved and continue to the end of the project close-out phase. There may be multiple sub-schedules within the overall master schedule for delivery of various components, with the level of detail depending on the purpose of the schedule.

The schedule prepared with the PDP, as well as schedules incorporated into consulting and construction contracts, are the baselines for monitoring and control. Progress is measured against these schedules, and can only be revised through a formal authorization process.

The standard schedule format is the Gantt chart. MS Project is the City's de facto tool for scheduling. This tool, along with others on the market, provide many useful features, such as resource-loaded schedules that can be developed with unit rates for labour and material, and can be used for load levelling, critical path management, tracking, and progress reporting.

A critical path method (CPM) schedule is another type of schedule often used on complex projects. The CPM provides a method for finding the series of interdependent tasks that if carried out in a particular sequence will result in the shortest time the project can be completed. These tasks are then defined to be critical and delays to any of them will extend the project duration. While the CPM is a useful tool under some circumstances, most projects utilize only the Gantt chart.

5.4.1.1 How to Develop a Gantt Chart Schedule

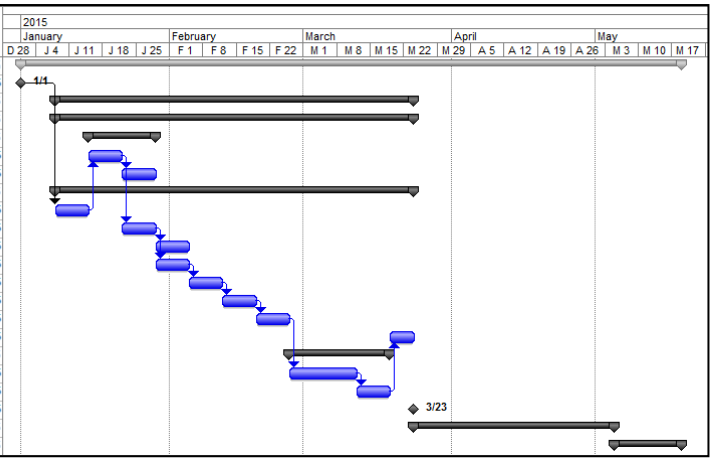
The Gantt chart schedule is developed by:

- **Sequencing the WBS activities:** The logical relationships between the activities must be identified. Most projects will have relationships where one activity cannot commence until a previous one has been completed, or where one activity must follow another one.
- **Defining project milestones:** A milestone is a significant point or event in the project, this may be a completion date, required in-service date, contractual date, or a combination of dates.
- **Estimating activity resources and durations:** The activity durations and material delivery times must be identified and considered in scheduling. The activity durations will depend on the resources available and level of effort, and is closely tied to the process of creating a project team.
- **Developing the schedule:** This is the process of analyzing the inputs and creating a schedule. This is often an iterative process until the best fit is achieved. Scheduling software provides a valuable tool for this process.

The Gantt chart is the basic schedule used on most projects. It provides a graphic display of schedule information with bars representing work durations on a timeline for a series of activities. An example of an MS Project Gantt chart is provided in Figure 5-5 for the first few components of the WBS previously presented.

Figure 5-5: Gantt Chart example prepared with Microsoft Project

ID	WBS	Task Name	Duration	Start	Finish
0	0	**Deliver a Capital Project**	**98 days?**	**Jan 1 '15**	**May 18 '15**
1	Milestone	Start	0 days	Jan 1 '15	Jan 1 '15
2	1.0	**Initiation Phase**	**53 days?**	**Jan 8 '15**	**Mar 23 '15**
3	1.1	**Initiation Phase**	**53 days?**	**Jan 8 '15**	**Mar 23 '15**
4	1.1.1	**Project Charter**	**10 days?**	**Jan 15 '15**	**Jan 28 '15**
5	1.1.1.1	Develop Project Charter	5 days?	Jan 15 '15	Jan 21 '15
6	1.1.1.2	Endorse Project Charter	5 days?	Jan 22 '15	Jan 28 '15
7	1.1.2	**Project Delivery Plan**	**53 days?**	**Jan 8 '15**	**Mar 23 '15**
8	1.1.2.1	Define Scope	5 days?	Jan 8 '15	Jan 14 '15
9	1.1.2.2	Create WBS	5 days?	Jan 22 '15	Jan 28 '15
10	1.1.2.3	Determine budget	5 days?	Jan 29 '15	Feb 4 '15
11	1.1.2.4	Prepare schedule	5 days?	Jan 29 '15	Feb 4 '15
12	1.1.2.5	Plan procurements	5 days?	Feb 5 '15	Feb 11 '15
13	1.1.2.6	Plan communications	5 days?	Feb 12 '15	Feb 18 '15
14	1.1.2.7	Approve PDP	5 days?	Feb 19 '15	Feb 25 '15
15	1.1.2.8	Initiation Phase Closure	3 days	Mar 19 '15	Mar 23 '15
16	1.1.3	**Updated Business Case**	**15 days**	**Feb 26 '15**	**Mar 18 '15**
17	1.1.3.1	Update business case	10 days	Feb 26 '15	Mar 11 '15
18	1.1.3.2	Acquire phase approval	5 days	Mar 12 '15	Mar 18 '15
19	Milestone	Complete Initiation Phase	0 days	Mar 23 '15	Mar 23 '15
20	2.0	**Execution Phase**	**30 days**	**Mar 24 '15**	**May 4 '15**
24	3.0	**Close-Out Phase**	**10 days**	**May 5 '15**	**May 18 '15**



The MS Project example schedule is based on the WBS of Figure 5-2, and includes the following:

- The WBS outline numbering has been included on the schedule, and provides a cross reference for all WBS components. The third level defines the deliverables and the fourth level the activities.
- MS Project has user defined calendars, and the Gantt chart time scale can be adjusted as desired.

- The Gantt chart includes a summary task 'Deliver a Capital Project' at the first line, this is the project title, and defines the total project duration. If labour hours, resources and costs are included within the tool the will also be rolled up in the summary task. The entire duration for the summary task is calculated from individual tasks beneath it.
- Gantt chart shows selected outline levels, third and fourth levels for the Execution Phase are hidden, as well as the second, third and fourth for the Close-Out Phase.
- Work is only assigned to activities (fourth level tasks on the chart), higher level tasks only provide summaries.
- A series of finish-to-start links has been included (the preceding task must be completed before the next task commences); links can be modified as needed. Other relationships that can be used are start-to-start, start-to-finish, and finish-to-finish, or none at all, with only fixed dates specified. The resulting schedule includes a number of work packages being carried out concurrently and a number sequentially.
- Milestones have been inserted at the start and end of the Initiation Phase, the activities have been sized to fit within the time frame. The Milestones are of 0 duration (days) and they are represented as filled up diamonds. Note that milestones need not be of zero duration. Though a milestone is not needed while creating a WBS, it is a good idea to have.
- MS Project is a very useful tool with a number of additional features not mentioned in the preceding example, including tracking and reporting capabilities.

5.5 Plan Quality Management

Quality—the degree to which the project fulfills requirements as intended in the business case—is one of the four project objectives. Poor quality can affect project delivery success and the product function, performance, life-cycle costs, and customer satisfaction.

5.5.1 Plan Project Quality Management

The process to identify the quality requirements and standards that will be used on the project. The documenting how the project will demonstrate compliance with those quality requirements.

5.5.2 Develop Project Quality Management Plan (PQMP)

The project quality management plan documents the quality requirements for the project and product, and how the project will achieve compliance.

The skills and qualifications of the resources providing services greatly affect planning for and delivering quality requirements. The quality management plan must therefore also specify selection of a suitable delivery team using the following guidelines:

- Adherence to professional or trade standards may be required for certain types of work.
- Minimum qualifications and levels of experience should be considered in filling all positions.
- The procurement plan should consider the relationship between qualifications, quality, and risk in the selection criteria, and be commensurate with the project needs.

The PQMP is part of the PDP.

5.5.2.1 How to Develop a PQMP

The Project Manager identifies the foundation quality requirements that will be used by the project. For project delivery the PM will utilize the PMM as a foundational quality requirement. Other foundation requirements are included in Industry standards for a specific product or service. This could include Industry standards such as the City Construction Specification, AWWA standards and Building codes, etc..

The intent is to identify the core quality requirements in order that the project team understands what processes and procedure are to be followed on the project. The quality requirements are known at a high level at the early stages of the project and can be refined as the project evolves. The quality requirements are also included in other documents such as consultant and contractor specification (contracts) as the project evolves.

Quality assurance and quality control activities are generated from the quality management requirements. The details are noted below.

5.5.3 Plan Quality Assurance and Quality Control

- **Quality Assurance (QA)** – The process of reviewing (or auditing) the quality requirements and the results from quality control measurements to ensure that appropriate quality standards and operational definitions are used. Quality Assurance ensures you are doing the right things, the right way. Results from this process are used to adjust the "plan", "technical specification" or "way the work is being performed" in order to ensure customer requirements and expectations are met.
- **Quality Control (QC)** – The process of monitoring, evaluating, and recording results of executing the quality activities to assess performance and recommend necessary changes. Quality Control ensures the results of what has been done are what were expected. If not, actions must be taken to assess the reason and adjust either the process or the control parameters.

A comparison of QA and QC is described in Table 5-4.

Table 5-4: Definition of Quality Assurance and Quality Control

	Quality Assurance (QA)	Quality Control (QC)
Definition	QA is a set of activities for ensuring quality in the processes by which products are developed.	QC is a set of activities for ensuring quality in products. The activities focus on identifying defects in the actual products produced.
Focus on	QA is **process oriented** and focuses on defect *prevention.* QA is a proactive quality process.	QC is **product/service oriented** and focuses on defect *identification.* QC is a reactive quality process.
Goal	The goal of QA is to improve development and test processes so that defects do not arise when the product is being developed. Quality Assurance makes sure you are doing the right things, the right way.	The goal of QC is to identify defects after a product is developed and before it's released. Quality Control makes sure the results of what you've done are what you expected.
How	Establish a good quality management system/plan and the assessment of its adequacy. Periodic conformance audits of the how the system/plan operates.	Finding and eliminating sources of quality problems through tools & equipment so that customer's requirements are continually met. Results are used in QA to adjust the process to eliminate consistent defects.
What	Prevention of quality problems through planned and systematic activities including documentation.	The activities or techniques used to achieve and maintain the product quality, process and service.

Table 5-4: Definition of Quality Assurance and Quality Control

	Quality Assurance (QA)	Quality Control (QC)
Responsibility	Everyone on the team involved in developing the product is responsible for quality assurance.	Quality control is usually the responsibility of a specific team that tests the product for defects.
Example	Verification is an example of QA. Verify that the PM followed the PMM and PDP. Verify that a Supplier follows their mixing procedure or IT followed their scripts.	Test results are an example of QC. The number of Change Orders on a project. Concrete testing is an example of QC.
As a tool	QA is a managerial tool.	QC is a corrective tool.

The QA and QC processes are required for every project. The expectation is for the PM to use these tools to plan, arrange, monitor, and administer the project to a standard that meets the project quality requirements.

The QA/QC plans and their monitoring may be assigned to a QA/QC manager or be undertaken by the PM. Reviews must be undertaken by someone other than the person who performed the work.

5.5.3.1 How to Plan Quality Assurance

The Project Sponsor, PM and project team are to provide QA throughout all project phases, regardless of the delivery method. The PM promotes QA by ensuring project team members follow a quality process. Refer to the table below for examples of Quality Plan, Quality Assurance and Quality Control.

The PQMP will include specific processes for checking the work, outputs, and deliverables. The PM coordinates the internal reviews and clearly defines reviewer expectations. Formal QA reviews may include:

- The Project Sponsor utilizing the Project Management Check List to ensure the PM is following the processes outlined.
- Project Sponsor review and sign-off of the PDP at stage gates.
- Review of technical memoranda and reports, which are typically submitted as drafts and updated to final documents after the review.
- Staged reviews for large and complex projects; this may include splitting the product life cycle into multiple phases, for example, splitting preliminary engineering into conceptual and functional design.
- For detailed design, sequential design reviews at the 30, 60, and 95 percent complete steps are common.

The PQMP identifies the process, who will participate in the reviews and includes updated review schedules. The PM needs to define the review period expectations so that the project team can properly plan and schedule its input.

The PM is responsible for initiating corrective action when the quality assurance objectives are not met.

5.5.3.2 How to Plan Quality Control

Quality Control applies to meeting identified project quality requirements for both project management and product delivery. The Project quality requirements define the specific QC processes and activities that need to be undertaken to ensure the product or service is meeting the specification identified.

This is a Monitoring and Control process, and is where every deliverable is inspected, measured in some way, and tested. It checks that the results conform to quality requirements (standards). It covers both the project and its products through the project. If any defects are found, then they will need to be corrected. The QC process needs to identify what the process is to address non-conformance.

5.5.3.3 How to Develop a Product Quality Control (QC) Plan

A product QC plan includes processes for adherence to the Quality requirements for the following:

- QC review and inspection events
- Procedures for reviews and inspections
- Timing of QC events and identification of reviewers and inspectors
- Checklists and forms for event tracking and documentation
- Quality metrics for comparison of results
- Process for addressing deficiencies, corrective actions and Non-conformance
- QC sign-off forms

5.5.3.4 Sample of Project Quality Management Plan

The following table identifies how the three quality elements interact.

Quality Requirement	Quality Assurance	Quality Control
Follow the PMM	Project Sponsor to utilize the Project Quality Check List to ensure the processes are being followed.	Phase Gate reviews. Sign-off on key deliverables.
Develop a Training Plan	The PM would review the training to ensure the processes outlined are being followed.	
Concrete meets a specific CSA standard	The CA ensures that the consultant, contractor and supplier are aware and follow the CSA standard (process).	Concrete tests. Concrete test results. Non-conformance identification and actions.

5.5.3.5 Project Delivery Check List Template

A template for the Project Delivery Check List is provided in Appendix B.

5.5.4 Plan Value Engineering (VE)

Value engineering (VE) is a technique that can be used on most projects to increase value and should be considered for all large projects. VE identifies unnecessary costs for products and services that can be reduced, while still ensuring that quality, reliability, performance, and other critical factors meet or exceed customer expectations. It seeks to develop best-value solutions, not necessarily lowest capital costs.

A multi-disciplinary team identifies the improvements through structured application of VE. The team identifies the product function or service; establishes a worth for the function; generates alternatives through brainstorming and creative thinking; and provides the needed functions and reliability at the lowest cost. Led by a VE facilitator, the team can comprise those involved in design, construction, and maintenance, as well as technical experts. A number of firms with qualified practitioners can provide VE expertise.

5.5.4.1 How to Plan Value Engineering

For a large and complex project, VE is usually undertaken at the end of the functional design phase, and results are incorporated into the functional design report. The VE team's recommendations are suggestions only; the City and the project Consultant make the decisions.

The cornerstone of effective VE is generation of a large number of ideas that may be developed into feasible changes. One of the best methods for obtaining a wide spectrum of ideas is to use an interdisciplinary team of specialists. It is helpful to have at least one team member from a markedly different background, since their comparatively naive viewpoint often produces fresh, unconditioned questioning. The team is headed by a person specifically trained to conduct VE reviews, and should include the project engineer or another employee of the project consultant who is familiar with the project design. Whenever practical, a representative of the City should participate. The VE workshop is an intense working session that culminates in an oral presentation of the VE recommendations.

Each member of the VE team contributes a different pattern of thinking and ideas that reflect their own experience. The ideas of each team member tend to stimulate responses and contributions from other team members, based on their backgrounds. Each team member readily responds, and the effect is that ideas represent each participant's own area of interest.

All VE efforts include some form of cost estimating or economic analysis, however experience has shown that the beneficial effect is not restricted to economic savings. Significant improvements are often made in function, reliability, maintainability, reduction in complexity, and other attributes.

Early VE tends to produce greater results, however there are opportunities for improvement at any stage. The ideas that are feasible for adoption change as a project moves from concept to completed design to construction and through to operation.

The conceptual design phase is one of the most productive times for VE review. As mentioned earlier, VE is undertaken at the end of the functional design phase. Changes are more readily adopted before the detailed design phase has been started. However, at the conceptual design phase, the engineering experience and competence of the VE team is critical, since appraisals must be made before the complete design is available.

Another type of VE review is often conducted when detailed design is 80 to 90 percent complete. At this stage it is usually too late to change basic concepts, however there are opportunities for improvements in details.

During the operations stage, cost-saving studies have not generally been called VE, however a VE-like process can still be carried out. To obtain savings at this stage, additional capital expenditure is often required. The VE team for an operational facility should have a combination of practical and theoretical skills.

Use of VE to reduce costs or enhance a facility's reliability, efficiency, or performance has been demonstrated in many different projects. The VE team has a rare opportunity to review the conceptual or functional design. For a relatively low expenditure, the VE team may identify substantial cost savings. At a minimum, a VE study increases overall sensitivity to project costs and boosts confidence for both the City and the project consultant even if significant changes in the design are not made. The City is thus assured of receiving the best value for the project budget.

Several approaches are used for VE reviews. One of the most direct uses steps labeled Information, Creative, Evaluation, Development, Presentation, and Report, as described below.

Information – During the Information step, the VE team reviews the proposed design, becoming familiar with available information on function, design, construction techniques, and costs. The worth of each project element (the least-costly way to perform it) is then determined, and the cost-to-worth ratio is calculated. A high cost-to-worth ratio indicates an area where VE effort may be profitable. Several other

techniques are also used to help the VE team target the project elements that have high potential for cost savings or project improvement.

Creative – After identifying areas with high improvement potential, the VE team begins a creative effort, sometimes called "brainstorming," to generate ideas for alternative methods of providing the basic function. Criteria and indicated requirements are challenged, and the broadest possible range of alternatives is considered.

Evaluation – The team leader rejects ideas obviously not suitable for implementation. The entire team then ranks the remaining ideas, listing advantages and disadvantages of each and evaluating items such as technological risks, time required for implementation, and cost. The most promising alternatives are selected for further study and refinement.

Development – The best alternatives are developed into more complete proposals with more detailed cost estimates and a summary of relevant information. Cost comparisons, as estimates of savings, are made on a total life-cycle cost basis that includes both construction cost and operation and maintenance cost.

Presentation – The VE team presents the alternatives to the City, the project Consultant, and other decision-makers. The City usually considers the project Consultant's response before making a final decision on which alternatives to incorporate into the project.

Report – A formal report of the VE study is prepared listing recommended alternatives, providing complete background information on the study, and describing the basis of recommended changes. The report ordinarily summarizes the life-cycle cost savings that would be achieved through adoption of the recommended changes. Sometimes, the most valuable VE suggestions do not result in cost savings, however all are included in the report.

5.5.4.2 Value Engineering Template (Future)

5.6 Plan Procurement

All capital projects should have previously considered the delivery method at a higher level of analysis as part of the business case development. Considerations may have included:

- Public Private Partnership (P3)
- Design Build (DB)
- Construction Manager (CM)
- Design Bid Build (DBB)
- In-House

The delivery method should be reviewed as part of the Planning phase and a more in-depth analysis may be warranted.

The Public Service normally procures infrastructure using the design, bid, build approach, which is the most common delivery model for most government projects in Canada. As such, the City has standardized contracts in place for this model. The allocation of risk between the City and the contractor is well defined and understood by all parties. Further, the City has established process and experience in administering of DBB contracts.

Standardized contractual documents likely do not normally exist for other delivery methods and likely have to be specifically developed for the project. Therefore, there is additional time and expense associated with developing new contracts for alternative delivery methods. These contracts have a different allocation of risk between the two parties and the City staff will not have experience in drafting or administering these

contracts. As such, there may also be additional risk associated with pursuing alternative delivery approaches.

Therefore, due to cost, schedule and contract risk, alternative delivery approaches would only normally be considered for Major Capital Projects. Alternative delivery approaches do not normally provide significantly positive value on smaller dollar value projects, thus would not normally be pursued on projects below the Major classification.

5.6.1 Review of Project Delivery Methods for Major Capital Projects

As Major Capital Projects involve large dollar amounts and risk, it important that the correct delivery method is selected an early stage of the project. Different delivery methods involve different allocations of risk between the contractor and the City and have the potential to impact the City's finances in both a positive and negative manner. As such, the PM must examine the project and determine the best delivery method for that project, considering alternative delivery methods.

Determination of the best method of project delivery will take considerable judgement on the part of the PM. This manual includes a Technical Memorandum developed by CH2MHill as a general guide to assist the PM in the determination of the best delivery method for the project. The analysis performed by the PM should consider the project risk profile, past experience with similar projects delivered using the DBB model as well as the overall project fit with a particular delivery model.

A professional consultant may need to be retained to assist the PM in the determining that the best method of delivery for a specific project.

5.6.1.1 Process for Review of Delivery Methods for Major Capital Projects

For all Major Capital Projects, the process would be for the department to determine the best delivery method for the project. The assessment of various delivery methods would be performed by the PM and approved by the Project Sponsor. Department Head approval should be obtained prior to submission to the Manager of Infrastructure Planning division.

The PM would then submit the recommendation and supporting analysis to the Manager of the Infrastructure Planning division.

The Manager of Infrastructure Planning Division would then perform a second party review on behalf of the CFO.

If confirmed by the Manager of Infrastructure Planning Division, the Project Sponsor would present the recommendation of delivery method to the Major Capital Projects Steering Committee for approval.

In the event the recommendation is for the project to be procured using an alternative delivery method, the next step would normally be to have performed an independent assessment of Value for Money.

Consideration should be given to whether Council approval of the delivery method is required as there is some precedent in having alternative delivery methods approved by Council.

The PM must also ensure that all projects delivered using an alternative delivery method are compliant with Provincial Legislation and Regulations (i.e. – The Public-Private Partnerships Transparency and Accountability Act).

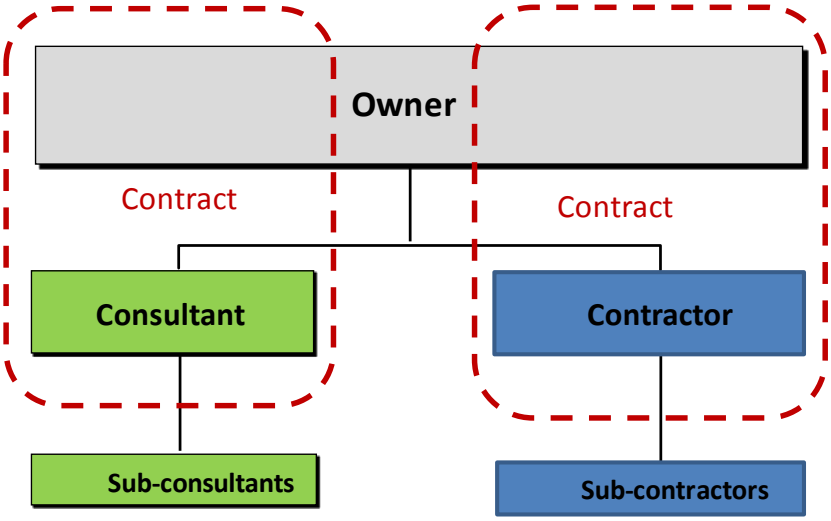
5.6.2 Review Design-Bid-Build Delivery Option

The most common project delivery method for infrastructure projects is DBB. This method is routinely selected for consultant and is the base assumption for the processes and procedures in this PMM.

At least two procurements are required for DBB projects delivered by a Consultant. The first is for the Consultant, who is assigned specific product delivery responsibilities, with the City's PM administering the consultant's services contract. The second procurement is for the Contractor.

With this approach, the Consultant and Contractor do not form a contractual arrangement with each other; instead, the project owner has a contract with each. The City authorizes the Consultant to act on the City's behalf in inspection and oversight of construction, as illustrated in Figure 5-6. Procurement and monitoring and control procedures consistent with the contractual arrangements are required. Roles, responsibilities and authority for the DBB delivery approach are provided in Section 5.6.

Figure 5-6: Design-Bid-Build Contractual Relationships



The procurement plan must consider which procurements are required, the schedule for procurements, how assignments will be made, who will be involved in the process, and whether any special requirements exist (refer to Section 6.3 for detailed descriptions of the procurement process and links to related City websites).

Consultant Selection – Every supply is to be initiated through competitive offers unless permitted as an exception under the Materials Management Policy (Policy clause B3). FM-002 further defines rules for exceptions on consulting assignments for capital, and non-capital projects. For assignments below the threshold limits, single-source (direct) assignments are permitted. Single-source assignments exceeding the FM-002 values must be approved by the Executive Policy Committee. In most cases, a competitive process is required for consultant selection.

Before soliciting proposals, the City must define its requirements by developing a request for proposals (RFP). The RFP approach is well suited to consulting services, since it allows Consultants to use their creativity and expertise in crafting proposals with unique features and approaches. For competitive proposals, the Consultant balances features with costs in attempting to arrive at a winning proposal. In all but exceptional circumstances, the Consultant pays proposal preparation costs.

Although required for every Consultant assignment, RFPs may vary in content and complexity, depending on the size and nature of the project. RFP preparation is discussed in "executing process group" in Section 6.4.

The time and effort needed to assign a consultant can be significant, because:

- The RFP is a major document that must include an accurate scope
- The project team must have the opportunity for input and review before the RFP can be issued
- Once the RFP is issued, consultants must have adequate time to prepare proposals and respond
- The proposals must be reviewed in detail and scored by the evaluation committee
- Consultant interviews may take time for coordination and execution
- After the selection committee has completed its rating, further time may be needed for internal recommendation reporting, review, and approval

If there are any other special requirements, they must be factored into the timeframe and cost. For example, if a two-stage proposal is used, a much longer time will be needed to assign a consultant.

Contractor Selection – For the DBB method of delivery, the design, drawings, and specifications are prepared by the Consultant (or by the City for in-house projects) and packaged into a bid opportunity for solicitation of competitive bids.

Construction contracts are the largest component of the capital budget and it is important to consider the contracting strategy when planning the work. Availability of contractors, size of the contract packages, sequencing of the work, and even time of year are potential considerations for packaging and issuing bid opportunities.

Third-Party Contracts –The need for third parties to participate in the work must be considered as part of the procurement planning process. Examples of potential third-party contracts are:

- Laboratory testing
- Specialist inspectors and testing agencies (concrete, roofing, welding, and air movement)
- Geotechnical Consultants
- Commissioning Contractors

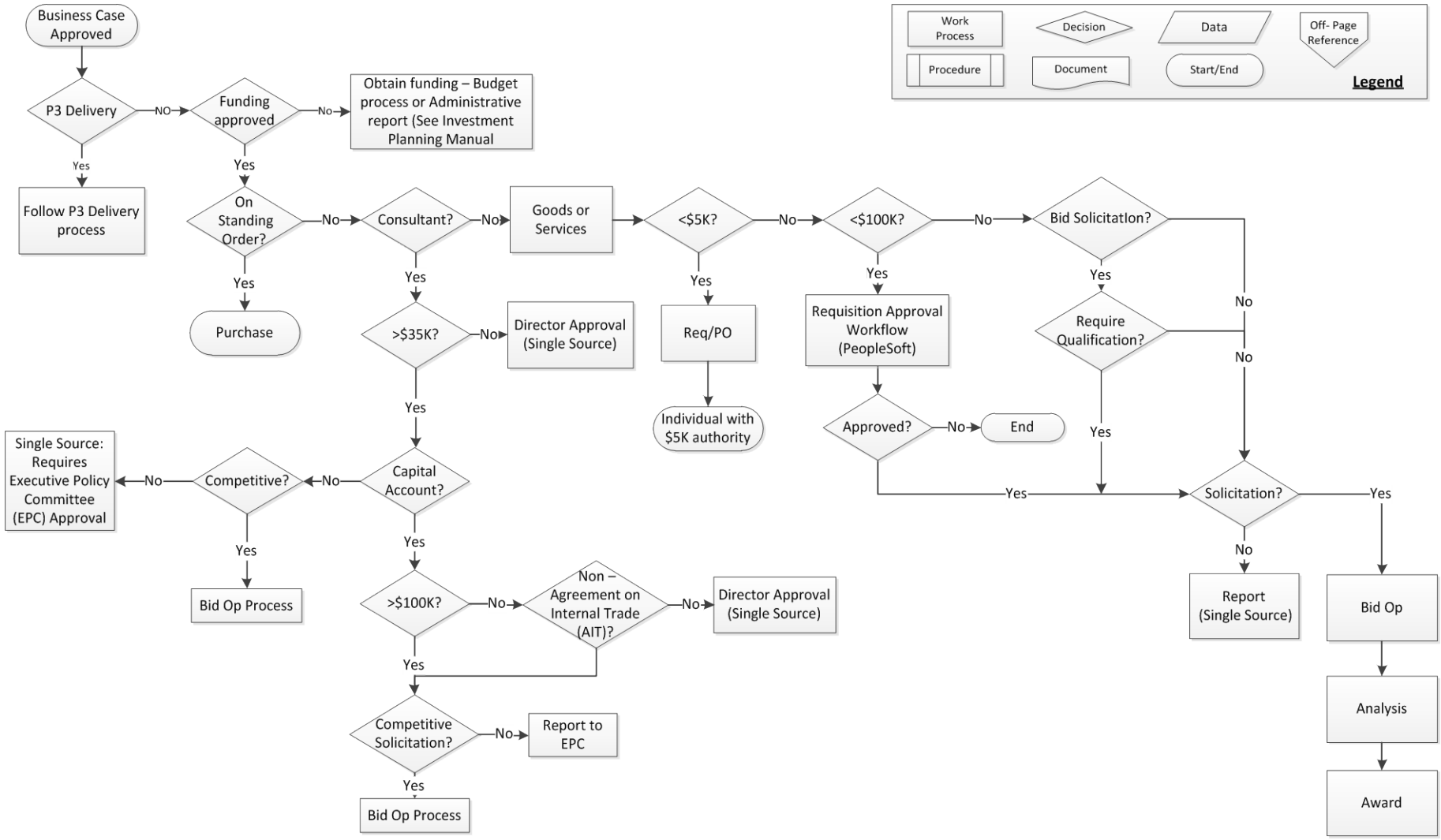
The procurement plan must identify whether these services are to be contracted directly by the City, included within the consulting contract, or included within a construction contract.

Once all the procurement details are known and the plan is developed, the details must be added to the work plan, with an appropriate work description, schedule, and cost estimate.

5.6.2.1 How to Plan Procurement

A procurement decision model based on the Materials Management Policy and FM-002 is shown in Figure 5-7. The model applies to all procurements, including consultant services and construction contracts. The decisions are based on budget amounts, whether the procurement is for a consultant, and whether the solicitation will be competitive or single source. If it is to be single source, the next decision is whether it requires Executive Policy Committee (EPC) approval. Consultant assignments below the FM-002 limits do not; limits are different depending on whether the supply is for a capital project. In most cases, higher-value capital projects require competitive proposals for both consultant services and construction contracts.

Figure 5-7: Process Decision Chart for Procurement Planning



5.7 Plan Human Resources

The human resources planning process includes identifying the organizational structure for the project, the resource requirements, and roles, responsibilities, and authority for project delivery.

5.7.1 Organizational Structure

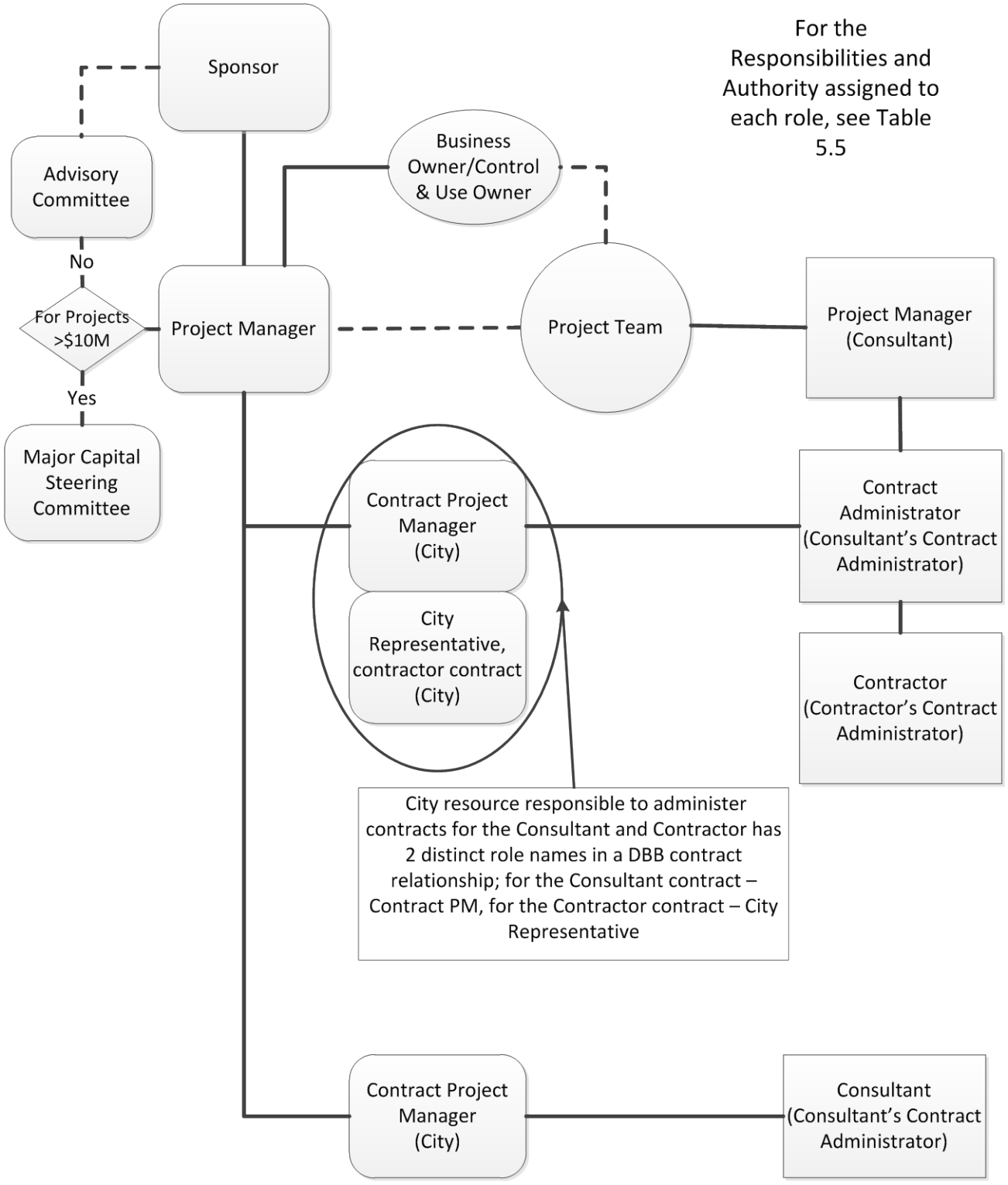
By definition, projects are temporary endeavours; the team structure lasts only as long as the project. However, some organizational structure features are used repetitively, with the same individuals filling the senior roles for most projects.

A Project Sponsor, PM, and project team are always required regardless of project size, with the team members, committees, and support staff depending on size and nature of the project.

The generic organizational structure for a consultant-delivered project is shown in Figure 5-8 (a Consultant is one type of vendor). The Project Sponsor, Major Capital Project Steering Committee, Project Advisory Committee and PM are all City personnel. The only expectation is that outside experts are sometimes added to the steering and Advisory committees.

Additional project staff from the City and from the Consultant are added, depending on the project needs, and the project-specific organizational structure is defined in the PDP.

Figure 5-8: Project Delivery Organization Chart



The organizational structure requirements for P3 and alternative project delivery (APD) option may be quite different than for a DBB delivered project, and may be specific to the project. In many cases, for P3 and APD the project delivery and its planning, execution, monitoring, and control are solely the vendor's

responsibility, so the City does not require the traditional organizational structure. It is the PM responsibility to define and populate the project organizational structure with the key roles in the PDP regardless of the delivery approach.

5.7.2 Resource Requirements

The resource requirements are identified during the development of the work plan. The resources required on the project will depend on factors such as:

- Skill set for specific tasks – require a design engineer for a specific discipline
- Time constraints – need more resources to complete in a specific time
- Resource availability – when resources are available based on current workloads

These factors need to be assessed in the development of the project work plan and the result captured in the resource section of the PDP.

5.7.3 Roles, Responsibilities, and Authority

Many individuals and groups of people may be involved in a project. Table 5-5 provides an overview of the participant's roles and their responsibilities and authority. Details on specific responsibilities and authority for each role are provided in the process and procedures in this PMM and built into the project delivery process charts in Appendix A.

The roles, responsibilities and authority and any updates or revisions are a refinement of the roles, responsibilities and authorities in the most current City policies, standards and directives, which were identified in PMM Section 2.0.

Table 5-5: Project Roles, Responsibilities, and Authority

Role	Responsibility and/or Description	Authority
City of Winnipeg (City)	Legal entity named on all City contracts.	Authority is delegated to members of the City's administration via the City of Winnipeg Charter
Chief Administrative Officer (CAO)	The CAO is the most senior bureaucrat in the civic service, responsible for management and operation of the corporation.	Under the Materials Management Policy, City Council has delegated senior levels of authority to the CAO, including materials management authority
Chief Financial Officer (CFO)	The CFO is responsible to ensure that there is a formal project management system and that a quality management plan is utilized to ensure the system operates as designed.	The CFO has delegated authority under FM-002 for Policy item administration and is the ultimate decision-maker on most project delivery issues. The CFO may further delegate authority to the Project Sponsor.

Table 5-5: Project Roles, Responsibilities, and Authority

Role	Responsibility and/or Description	Authority
Project Sponsor	– The individual within in the business unit that is responsible to deliver the project who has the authority to assign resources and ensure the project is successful. – Is at a level in the organization that can provide the support that the project need to be successful – Acts as a project champion, supporting the project's goals and objectives; keeps updated on major project activities; and is a decision-maker for the project. – takes part in selection of the PM, project initiation, and development of the project charter. – is involved in the project planning process and reviews and accepts the PDP and its updates. – supports the PM; assists with major issues, problems, and policy conflicts; and removes obstacles.	The Project Sponsor authorizes use of resources for the project, approves major deliverables for delivery to the business owner, and signs off on each project phase.
Manager of Capital Projects	The Manager of Capital Projects prepares and guides capital projects management by introducing methodologies, conducting QA reviews, and preparing annual reports.	The Manager of Capital Projects is the owner of the PMM and authorizes changes and updates.
Major Capital Project Steering Committee	The Major Capital Project Steering Committee is project-specific and is formed for major capital projects. It is responsible for monitoring and managing project risks. The Project Sponsor is the Committee Chair.	The Major Capital Project Steering Committee provides direction to the PM on managing project risk and has decision-making authority.
Project Manager	The PM develops the PDP and delivers the project with support from the project team. The PM manages the project team's performance and secures acceptance and approval of deliverables from the Project Sponsor. The PM is responsible for communications, risk management, escalation of issues that cannot be resolved in the team, and making sure a quality project is delivered on budget, on schedule, and within scope.	The PM is responsible for project delivery, and acts within the boundaries of the PDP.
Change Manager	The ChM acts as a resource to the PM and the project team. The ChM is responsible for change management deliverables, such as stakeholder and change assessments, communications, change management planning and implementation.	The ChM's authority is defined by the CAO and by Department Directors who select departmental change managers for training and certification.
Contract Administrator (CA)	The CA is the City's representative for administration of contracts. This role may be filled by the Consultant or by a City representative on in-house projects.	The CA's authority is defined in the general conditions (Cs) for the contract.
Project Team	The project team executes the project along with the PM. It consists of a variable number of members who are brought in to perform tasks according to the project work plan and schedule. The project team members produce outputs or deliverables as outlined in the plan at the level of effort defined for them. On larger projects, some project team members may serve as task leads, managing staff on tasks and providing technical leadership.	The project team performs administrative and technical functions in accordance with industry practices, as defined by the PDP and under the direction of the PM or delegate.

Table 5-5: Project Roles, Responsibilities, and Authority

Role	Responsibility and/or Description	Authority
Project Advisory Committee	The Committee is advisory in nature and provides advice/not direction to the PM. The advisory members act individually and collectively as vocal and visible project champions in their representative organizations. The Committee is meant to provide a support function to the PM, drawing on experience and expertise from a variety of backgrounds to improve the overall quality of the project delivery. The Committee may also facilitate better coordination of project activities between different areas of the City. The Project Sponsor is the Committee Chair.	Provides guidance to the project and advice on project deliverables, issue resolutions, policy decisions, and scope changes, but does not have decision-making authority.
Selection or Evaluation Committee	Evaluating proposals or bids with multiple weighted criteria requires an Evaluation Committee with appropriate expertise. The team should consist of a technical and financial representative and have access to Legal Services and Materials Management.	Reviews and rates proposals, provides evaluations.
Corporate Administration	The project delivery team includes multiple parties at various steps with various roles. Corporate administration participants include Materials Management and Legal Services, which each have a defined and sometimes ad-hoc role in project delivery.	Provides support and advice for effective project delivery related to City processes and procedures.
Customers	The customer is the end user of the service that the product or service provides. The customer can be external or internal entities.	Provides input and opinions into the City's Service Level targets.
Business Owner	The entity in the project organizational structure that accepts receipt (ownership) of the final product or service (deliverables). Is a generic role name used for both asset and non-asset based projects. Have the responsibility or authority in the organization for the investment. the control and use owner and the business owner can be the same individual on a project.	Sign-off of the initial requirements and the final deliverables.
Control & Use Owner	Responsible for ownership of the asset on the City's behalf. Responsible to define the service level targets based on consultation with the customer. Defines the strategic service need which includes the service the asset provides. Manages the risk of existing assets to ensure service target are meet at the lowest lifecycle costs. Ensure that the Investments and resulting benefits meet the needs of the customer. the control and use owner and the business owner can be the same individual on a project.	Provide the service that the customer needs and is willing to pay for.
Vendors	Vendors are contracted to provide additional products or services the project will require. Consultants are one type of vendor, as are Construction Contractors and those providing third-party paid services.	Provides products or services in accordance with contracts.

Table 5-5: Project Roles, Responsibilities, and Authority

Role	Responsibility and/or Description	Authority
Stakeholders	Stakeholders are all those groups, units, individuals, or organizations, internal or external to the organization, that have an interest in, are impacted by, or can impact, the outcomes of the project. This includes the project team, Project Sponsors, Steering Committee, customers, customer co-workers, public, special interest groups, and regulators.	Authority depends on the type of stakeholder (see above).

5.7.4 Duties and Obligations

Successful projects are planned, designed, and built by a project team consisting of a PM, Project Delivery Team, Consultant, and Contractor. Quality can only be achieved when each team member competently and in a timely fashion fulfills their responsibilities in cooperation with the other team members. The duties and obligations inherent in these responsibilities and required for the success of the project are listed in Table 5-6 for a project team.

Table 5-6: Duties and Obligations of the Project Team

Duty/Obligation	Details/Examples
• Fully disclose facts	• Provide access to all pertinent project data • Identify all known constraints • Define project objectives and expectations and communicate them accurately • Provide other agencies and public authorities with required information
• Be truthful	• Establish and maintain trust • Recognize the need for professional respect and collaboration • Keep commitments
• Maintain integrity (perform on a highly ethical plane)	• Be truthful; don't simply tell team members and stakeholders what they want to hear • Fully disclose related external interests • Avoid conflicts of interest • Only accept work you are qualified for (or add appropriate expertise to the team)
• Demonstrate leadership	• When crises occur, carefully define the problem, not just the symptoms, and take positive authoritative action to solve it
• Enhance communications	• Facilitate and encourage communication • Inform the Consultant of how and why the City/system works • Avoid the we/they mindset • Be articulate; explain clearly and succinctly the merit and the benefit of proposed schemes in a balanced and objective, yet authoritative, manner • Create a process that allows Control & Use owners and key stakeholders to contribute

Table 5-6: Duties and Obligations of the Project Team

Duty/Obligation	Details/Examples
• Establish reasonable and attainable objectives	• Reach early agreement on a reasonable program of requirements and attainable performance requirements • Carefully consider relationships between cost performance, function, and aesthetics • Provide detail on objectives and refer to specific aspects of a project, such as function, operation, schedule, technical matters, quality, aesthetics, and administrative, fiscal, or management requirements
• Be responsive to the established scope, budget and schedule	• Be vigilant and committed, showing forethought and anticipation in protecting the City's interests (and hence, those of the public) in the conduct of assigned projects
• Be prepared	• Maintain files in order • Be prepared for meetings • Respond to team members and stakeholder requests in a timely fashion • Keep the Control & Use owner informed
• Allow adequate time for performance	• Mutually develop a realistic schedule • Recognize that an unrealistic work schedule may discourage sound professional judgment
• Delegate or assign decision-making authority appropriately and support that authority	• Establish at the outset and maintain the necessary and appropriate channels of responsibility and authority • Empower the PM with appropriate authority
• Be realistic in the assumption of risks and liability	• Cleary identify conditions that are not easily understood or determined in advance
• Encourage quality	• Develop the plans and follow the plan • Focus on the process and continuous improvement • Encourage innovation and creativity in the project team
• Accept authority and responsibility	• Be accountable for satisfactory overall project execution and control of budget • Be responsible for all project staff, including vendors • Carefully consider and define fee arrangements without resorting to subsequent requests for additional fees on the basis of alleged misunderstandings on the scope of services to be provided • Ensure that work is accurate and precise so the City need not duplicate the design process to correct drawings and specifications
• Fund project adequately	• Recognize that design is critical to the overall project success; saving money at the expense of a competent design is a poor economic decision
• Strive for efficiency and economy	• Effectively coordinate all administrative and cost expenditures on the project
• Make timely decisions	• Provide strong leadership to make and encourage sound and timely decisions, including project reviews and approvals
• Allow freedom for innovation	• Be open to new ideas • Allow open discussion on problems and situation to promote new thinking and concepts

Table 5-6: Duties and Obligations of the Project Team

Duty/Obligation	Details/Examples
• Be responsive to public	• Be receptive of and responsive to public input to serve the public well on the City's behalf
• Comply with codes, regulations, and laws	• Be familiar with and current on a broad range of legislation and regulations to best assist the City in securing the most acceptable project and in obtaining the most advantageous cost sharing
• Be familiar with city procedures	• Ensure that assigned personnel are familiar with City procedures and requirements; do not expect City personnel to train the Consultant's personnel

5.7.5 Create a Project Team Organization Structure

A human resources plan is recommended for each project to define the specific organizational features and identify personnel assigned.

Human resources are grouped into two subsets, the project management team and the product team. The project management team is responsible for leadership and for carrying out the initiating, planning, executing, monitoring, controlling, and closing project management processes throughout the project phases. The product team is technical and is responsible for delivering the product, including studies, designs, and construction, or for providing other types of products, results, or services.

For in-house projects, the human resources plan includes individuals with the required skills and qualifications to complete the product work. This may include engineering resources, technical support, site supervisors, construction workers, and site inspectors if the project is for construction, or many other combinations of human resources and skills, depending on the product.

For consultant projects, the Consultant assigns resources to the product work, and the City's role is focused on project management and administration of the associated contracts.

The human resources plan includes the following components:

- An organization chart
- A list of roles and responsibilities for the project positions
- A resource matrix detailing the time allocations for each individual on a task-by-task basis

5.7.5.1 How to Prepare a Project Organization Chart

The project organization chart is prepared by selecting the positions and reporting relationships for the project. The organization chart can draw from the generic organizational structure, however only those relevant and needed for the project should be included.

The human resources plan must assign personnel to each position. The commitment of the project team proposed for a project must be approved by the Sponsor or in some situation the appropriate Departmental Manager.

The roles, responsibilities, and levels of authority for each position must also be identified for the organization chart. Any variation to the standard role, responsibility, or level of authority definitions must be specifically identified in the human resources plan.

5.7.5.2 Project Organization Chart Template

A template for the Project Organization Chart is provided in the PDP template in Appendix B.

5.7.5.3 How to Prepare a Resource Matrix

The resources matrix consists of a table of labour input for each position identified for each task, as shown in Table 5-7, and includes the following:

- The WBS and task names are identified in the left-most columns
- All positions are included as column headings, whether they are part of the project team or support services
- The matrix cells include the labour for each position, usually reported in hours

5.7.5.4 Resource Matrix Template

No standalone resource matrix template has been developed however MS Project has this template and features to assist a PM in managing resources.

Table 5-7: Example Resource Matrix

WBS	Task Name	Project Sponsor	Member 1	Member 2	Member 3	Member 4	Project Manager	Administrative Assistant	Total Hours
			Advisory Committee						
0	**Deliver Capital Project**								
1.0	Initiation Phase								
1.1.1	Project Charter								
1.1.1.1	Develop Project Charter	5	10	10	10	10	25	15	85
1.1.1.2	Endorse Project Charter	5	2	2	2	2	8	5	26
1.1.2	Project Delivery Plan								
1.1.2.1	Define Scope						20	5	25
1.1.2.2	Create WBS						20		20
1.1.2.3	Determine budget						20		20
1.1.2.4	Prepare schedule						10		10
1.1.2.5	Plan procurements						10		10
1.1.2.6	Plan communications						5	5	10
1.1.2.7	Approve PDP						30	25	55
1.1.2.8	Initiation Phase Closure	5					5	2	12
1.1.3	Updated Business Case								
1.1.3.1	Updated business case						40	5	45
1.1.3.2	Acquire phase approval						80		80
2	Execution Phase								
3	Close-Out Phase								

5.8 Plan Communications

Communications planning is the process of determining the project information needs and defining the approaches to be used. The communications plan documents the project approach, with the information in

a specific format, provided at the right time, and limited to only what is needed. The PM is responsible for the project communications plan.

5.8.1 Develop a Stakeholder Assessment

The stakeholder assessment is first developed in the Initiation phase and continues to develop. See Section 4.0 for information on the initial stakeholder assessment.

Assessment of the project stakeholders is critical to the PM and the team in understanding who is impacted, what their impact is, their importance and influence and how the stakeholders will be managed.

Some of the questions to ask about the overall project AND various decisions being made within the project include:

- How interested will the community be?
- What information do we need from the community?
- What issues or historical factors should be considered?
- What are the risks of engaging the community?
- What opportunity exists to adjust the scope of the project to respond to newly identified community perspectives?
- Who are the obvious and not-so obvious stakeholders?

Assessing stakeholder interests in the project, requires consideration of the project objectives, as well as an exploration of unintended issues that the project might impact.

Once the Stakeholder assessment is completed a number of strategies can be developed to address stakeholder interests or needs.

The communication plan identifies how each stakeholder will be communicated with in order to address their interest or needs.

Table 5.9 in section 5.8.2.1 provides a format for documenting communication and engagement activities designed to address issues and interests identified in the stakeholder assessment

The assessing of stakeholders and communicating to those stakeholders evolves as the project lifecycle processes. This is an iterative process where the PM is continually has to manage the plan based on feedback. Communication is two way.

5.8.1.1 How to Develop a Stakeholder Assessment

Table 5.8 provides an example of a Stakeholder Assessment

Table 5-8: Stakeholder Assessment Example

Stakeholder	Interest and Expectations	Importance and Influence	Assessment of Impact	Strategies for Gaining Support or Reducing Obstacles

5.8.2 Develop a Communications Plan

The information needs and the distribution methods for project communications vary widely for different types of projects, and must be developed for each project. The core of the communication plan defines who will communicate with whom (stakeholder assessment) and who will receive what information when (communication plan). An essential output from the communication planning process will be defining a balance between too much or too little communication.

5.8.2.1 How to Develop a Communications Plan

Table 5-9 provides an example of a communications plan.

Table 5-9: Communications Plan Example

Target Audience	Objective (Need/Why)	Messages (What)	Timing (When)	Delivery Method (How)	By Whom	Feedback Mechanism
Project Sponsor						
Major Projects Steering Committee						
Advisory Committee						
Business Unit Owner						
Customers						
Mayor & Council Members						
Special Interest Groups						
Regulators						
General Public						

The following principles guide development of a communications plan:

- **Target audience –** The stakeholder log lists people and groups to be included in the communications plan and receive information.
- **Purpose or objective –** The underlying reason for any communication should be clearly understood. Purposes include complying with reporting requirements, asking for special permission, and conveying new information.
- **Messages –** Messages must be consistent with their purpose and compatible with their audience.
- **Timing –** The timeframe and frequency of communications should be identified.
- **Delivery methods –** The delivery methods to be used should be specified. Delivery methods include in-person meetings, conference calls, video conferencing, online meetings, emails, and hard-copy reports.
- **Responsibility –** The person responsible for communicating each type of information should be identified. For sensitive information, the person who can authorize release must also be identified.
- **Feedback mechanism –** The need for feedback and any requirements for the feedback such as what is expected and the timeframes should be identified.

Official Openings or Ground breaking ceremonies

A common part of a project communication plan relates to the ground breaking or official opening ceremonies for completed major projects. These events recognize the City's efforts and public contributions for the benefit of the public.

The CAO supports official ceremonies for designated projects involving central council or community facilities. The PM is responsible for including these ceremonies in the communication plan.

Guidelines include:

- The time and date for the opening ceremony for a Central Council facility will be determined by the appropriate director in consultation with the Mayor's Office.
- The Mayor's Office will prepare invitation lists in consultation with the department.
- The Mayor's Office will print invitations, and the department will address and mail them.
- Where the provincial government has been involved in funding a facility, provincial representatives must be invited to the official opening.
- The Mayor's Office, in consultation with the department, will determine program format.
- A bronze plaque dedicating the facility to the citizens will form part of the ceremony when the capital cost of the facility exceeds $500,000.
- The project budget is to include all costs associated with the opening.
- If the provincial government has been involved in funding a facility, provincial representatives must be invited to the official opening.

Project Manager Responsibilities

For official openings, the PM with the assistance of the Dept/Corp Communications Officer, is responsible for coordinating all arrangements and overseeing the conduct of the ceremony, some possible activities including:

- Preparing text for the brochure, plaque, media release, and project sign
- Determining a suitable site for the ceremony
- Providing for parking at the site, or for alternate transportation (transit)
- Designing the site setting, monument, and plaque
- Constructing the site, monument, and plaque
- Developing information brochures and invitations
- Developing guest list (Consultants, Contractors, City Representatives, Politicians, members of the public, and so forth)
- Developing ceremony program (format, speakers, ribbon cutting, music,)
- Arranging for photography
- Preparing alternate arrangements in case of inclement/unseasonal weather
- Arranging for site facilities/services (lectern, public address system, flags, cleaning crews, traffic control,)
- Making post-ceremony reception arrangements (location, food, refreshments, entertainment)
- Arranging for site clean-up and full opening of the facility

5.8.2.2 Stakeholder Assessment and Communication Plan Template

A template for the Stakeholder Assessment and Communication Plan is provided in Appendix B.

5.8.3 Public Engagement

References exist throughout the "OurWinnipeg" plan and its direction, strategies and related policy documents, which highlight the importance of and interest in working with community stakeholders to identify and address community needs and issues in the work undertaken by the City of Winnipeg. "Public Engagement" encompasses the range of activities that support this relationship between the City and its community members.

As we heard through SpeakUp Winnipeg (the public engagement program associated with the development of OurWinnipeg) Winnipeggers expect to be involved in the decisions that affect them and their city, including determining what is important to them and how their community grows and develops.

The Spectrum of Public Engagement

The spectrum of public engagement (Refer to Table 5-10 below) demonstrates the range of possible types of engagement with stakeholders and communities. It ranges from the mere provision of information through to empowering the community to make decisions. The role and input of citizens becomes stronger from left to right across the spectrum. Table 5-10 identifies the goals associated with each level of engagement. It also identifies the level of commitment that each level represents (and is typically expected by the public) in order for members of the public to feel that the process has been meaningful.

Table 5-10: The Spectrum of Public Participation

	Inform	Consult	Involve	Collaborate	Empower
Public Participation Goal	To inform the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solution	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of preferred solutions.	To place final decision-making in the hands of the public.
Promise to the Public	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision	We will look to you for advice and innovation in formulating solutions and incorporating your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.
Example Techniques	• Fact sheets • Web sites • Open houses	• Public comment • Focus groups • Surveys • Public meetings	• Workshops • Deliberative polling	• Citizen advisory committees • Consensus-building • Participatory decision-making	• Citizen juries • Ballots • Delegated decisions

It is sometimes assumed that the level of difficulty involved in the engagement process increases with the level of participation, however in reality, where engagement is effective, no part of the continuum is more difficult or preferable to another. Every public engagement process requires balanced and objective

information to assist participants in understanding the question at hand, the alternatives to choose from and the opportunities the decision presents.

Determining the appropriate level of engagement requires thoughtful consideration of the degree of decision-making control that can be legitimately allocated to members of the public. The statements in the table below can help identify the appropriate level of engagement:

Table 5-11: The Public Engagement Framework

Level of engagement	Which statement applies to the decision being made
Inform	I need to share information with individuals or groups about a decision that has been made, or about a decision that needs to be made.
Consult	I need to ask residents, groups or specific stakeholders about their views on the decision being made. Their feedback will be considered when the decision is being made.
Involve	I need to get feedback from an individual or group to find out how they will be affected by the outcome of a decision. Their feedback will be considered when the decision is made.
Collaborate	We need to develop joint alternatives, working with community members/groups and employees to propose alternatives that will work for and be supported by those affected by the decision.
Empower	I need to work with a community member of group in a process in which they have the final decision-making power.

It is important to consider these statements for each phase or deliverable within the project management plan and to acknowledge that each step in the process may have more than one public participation objective. For example, communication should occur at each decision point at minimum to ensure the public is kept informed.

Guiding Principles

Effective Public Engagement depends on commitment to a number of guiding principles. The following have been adapted from the City of Guelph's Community Engagement Framework and reflect commonly recognized characteristics and core values of best practices in public engagement:

- **Inclusive:** Participation by those who will be affected by a decision is encouraged. Relationships with stakeholders are built by using a range of tools to engage varied audiences.
- **Early Involvement:** The public is involved as early as possible in the community engagement process so stakeholders have time to learn about the issue and actively participate.
- **Access to Decision-Making:** Processes are designed to give participants the opportunity to influence decisions.
- **Coordinated Approach:** Community engagement activities are coordinated to use community and City resources effectively.
- **Transparent and Accountable:** Processes are designed to be open and clear. Stakeholders will understand their role, the level of engagement and the outcome of the process.
- **Open and Timely Communication:** Information is provided that is timely, accurate, objective, easily understood, accessible, and balanced.
- **Mutual Trust and Respect:** The community is engaged in a fair and respectful way that fosters understanding between diverse views, values, and interests.

- **Evaluation and Continuous Improvement:** Resources are committed to evaluating engagement processes to ensure engagement activities are effective.
- **Equitable Engagement Process:** Engagement processes are designed to allow all community members a reasonable opportunity to contribute and to develop a balanced perspective. This may require special outreach to especially vulnerable or marginalized populations.

Supplementary Considerations:

Consideration of the guiding principles is important at every stage of planning, implementing and evaluating public engagement activities. The following provide more specific considerations that support these guiding principles, and should also be considered throughout the process of planning, implementing and evaluating public engagement activity.

City of Winnipeg Universal Design Policy

According to the City of Winnipeg Universal Design Policy, all communications and public engagement activities of the City of Winnipeg shall take place in accordance with Universal Design Principles.

If preparing printed materials for engagement activities, please refer to the CNIB Clear Print Guidelines, available at http://www.cnib.ca/en/services/resources/clearprint/pages/default.aspx.

For guidance on how to make engagement activities accessible, please contact the Universal Design Coordinator.

Plain Language

Like good communication of any kind, plain language is clear, concise, and uses simply constructed sentences. Plain language tells the audience exactly what the audience needs to know without using unnecessary words or expressions. It is not baby talk or overly simplistic, however lets the audience understand the message easily.

Plain language is more than just short words and short sentences — although those are often two very important guidelines for plain language. When you write in plain language, you also organize it logically to make it easy for the audience to follow. You consider how well the layout of your pages or screens works for your audience. You also ensure that the information you provide is relevant to the audience. What is plain language for one audience may not be plain language for another audience.

Communication that is clear and to the point helps improve all communication because it takes less time to read and understand. It also improves audience response to messages. Using plain language avoids creating barriers that set us apart from our audience.

Manitoba Freedom of Information and Protection of Privacy Act (MB FIPPA)

When obtaining personal information from community members, it is important to remember that the MB FIPPA imposes obligations on the City as to how information, particularly personal information is collected, used, disclosed and disposed of (destroyed). The Act controls the manner in which public bodies like the City of Winnipeg collect personal information, and protects individuals against unauthorized use or disclosure of personal information.

The Act which can be found at http://www.gov.mb.ca/chc/fippa/understanding_fippa.html#21 , identifies an extensive list of what constitutes “personal information”. Any time you consideration collecting information that is personal in nature, a good rule of thumb is to collect only the minimum amount of information necessary to accomplish the purpose for which it is being collected.

It is also important to note that a record of personal information can take various forms. It can be information that is written, photographed, recorded or stored in any manner, on any storage medium or by any means including by graphic, electronic or mechanical means.

If consideration is being given to creating records of any personal information through your public engagement activities, please consult with your departmental FIPPA contact before any information is collected.

5.8.3.1 Public Engagement Procedure

A Public Engagement procedure is under development.

5.8.4 Define Performance Reports

Once the communications plan has been established, the PDP must identify the reports and the reporting format for the project. The PMM identifies in Table 5-12 below, the specific performance reports that will be used in the City of Winnipeg. The intent is ensure that the stakeholder both horizontally and vertically in the organization become familiar with information that is needed to communicate the project performance status accurately. The intent is move away from ad-hoc reporting where individuals develop stand-alone reporting template.

Note: A number of the reports below are being reviewed and are not fully developed. Some may be deleted from the inventory of standard reports templates.

Table 5-12: Common Performance Reports

Report	Purpose
PM Checklist	Provides a record of completion of PMM-required actions.
Status Report – Project Management	Summarizes data, tracks progress, and compares progress with baselines defined in the PDP, risk, schedule, financial forecasts and may include earned value management.
PM Dash Board Report	
Status Report – Contract	
Status Report – Consultant	
Project Issue-Decision Log	Tabulates and tracks all project issues and resulting decisions on the project communications.
Project Change Log	Track changes and potential changes.
Change Control Report	Provides an integrated view of the project, consultant, and construction changes, enabling forecasting.
Risk Register and Report	Identifies exposure to risk events for the Consultant and Construction Contractor, identifies actions taken and required, and provides information for integrated change control.
Consultant Performance Review	Documents Consultants' performance and provides feedback to Consultants.
Final Close-Out Checklist	Prompts for final documentation and closure of all tasks and budgets.
Lessons Learned	Documents what went well and what did not for future reference and application to the continual improvement process.

A key concept that is being implemented into the report design is a hierarchal reporting structure. Construction reports will roll-up to Consultant reports, which will roll-up to PM reports, which will roll-up to PMO reports, and ultimately to Dash Board reports.

The standard performance reports will have guidelines for distribution to specific roles in the project organizational structure and frequency of distribution. These guidelines will be embedded in the help notes.

The PDP is to identify any ad-hoc or non-standard reports required, distribution and the frequency of distribution.

5.8.4.1 Performance Report Templates

The templates listed in the above table will be provided in Appendix B as they become available.

5.8.5 Reporting to Committee

FM-004 requires the administration to report to the Council quarterly on all Consultant contracts. A standard report is available from the City's website at http://www.winnipeg.ca/matmgt/templates/consultants/Consultant_Information_Page.stm.

FM-004 identified a report that must be submitted quarterly in the standard format with no exceptions on project > $10 million.

The PM must ensure the accuracy of reports as they pertain specifically to each Consultant assignment and project.

5.8.5.1 Council Quarterly Report Template

A template for the Council Quarterly Report is provided in Appendix B.

5.8.6 Plan Records Management

Projects must be managed in accordance with a comprehensive records management system managed by the owning business unit. The primary objectives for a system of this type are to:

- Provide an efficient and intuitive document identification system
- Store all related documents efficiently so they can be readily retrieved
- Record the history of each document including versions, approvals, and certifications
- Minimize the cost and time of records management
- Facilitate provision of records to stakeholders for all aspects of the project

For the City, the Freedom of Information and Protection of Privacy Act (FIPPA) and the Records Management By-law No. 86/2010 define a record as "any kind of recorded information that is created or received by, or in the custody or control of, the City regardless of its physical form or its characteristics."

5.8.7 Record Types

The table below identifies the type of records generated on a project.

Table 5-13: Record Types

Record Category	Description
Drawings	This includes all formal drawings produced as a stand-alone document or design packages. These are typically defined as "Design or Construction drawings" however the intent is any drawing produced and formally used on the Program will fall under this category.
Project Deliverables	Are specific formal document that is a product of a Project, however the life of the document continues on past the end of the Project. These can include as an

	example; Concept Design reports, Preliminary Design Reports, O&M, Contracts and Standard Operating Procedures. Other documents include land purchase, environmental impact reports
Project Records	These are documents produced to support the management of a project. These documents have no active use once the Project has been closed. These can include as an example; Progress Estimates, Change Orders, Schedules, Meeting minutes. **Will include Administration records such as:** • Financial (Project costing, invoices and other accounting records) • General correspondence • Reporting • Human Resource Management • Planning • Project specific Procedures
Uncontrolled documents	All hardcopy documentation, if not controlled by an authorised person shall be deemed "uncontrolled" by the person who prints the document

5.8.8 Project Record Index (PRI)

The PDP must consider the use of a project record index (PRI) and define the rules for its use if one is to be used. The PRI is used to track and monitor changes in the work. As soon as an issue is identified which has the potential to cause amendment to the original contract, it is entered in the PRI. A unique number is assigned to the issue for recording in the PRI that associates all subsequent and associated change management documentation, including the reason for the potential change. All subsequent correspondence related to the change is then referenced in the PRI through the numbering system.

5.8.8.1 Record Management Procedure

A record management procedure is in Appendix E.

5.9 Plan Risk Management

Risk is inherent in delivery of all projects, and risk management must be applied to all major projects. The objective of risk management is to reduce the chance that the project will not meet its goals and objectives.

The five processes in a complete risk management plan (RMP) are:

- **Identify risks –** This process identifies risks and documents their characteristics. Each risk must relate to at least one of the project objectives (cost, scope, schedule, and quality). Risks are recorded on a risk register that will be further developed as part of subsequent processes and maintained and managed throughout the project.
- **Perform qualitative risk analysis –** For this process the identified risks are evaluated by assigning probability of occurrence and consequence scores to each risk and prioritizing the results. The qualitative risk analysis provides a rational basis for quantification of a risk contingency reserve.

- **Perform quantitative risk analysis –** Quantitative risk analysis is the process of numerically analyzing specific risks to the project objectives. This level of risk analysis can be very detailed and complex and is therefore only applied to specific risks under specific conditions.
- **Plan risk responses –** Once risks have been identified and analyzed, the threats they pose to the project can be dealt with through risk responses.
- **Monitor and control risks –** The monitoring and control process is for implementing the risk response plans and monitoring, evaluating, and updating the process throughout the project. The risk register is used for this purpose.

The PMM takes a progressive approach to risk management through the project phases, providing a continuum from the initiation phase to close-out, as outlined below.

- **Business Case Risks** – Risk analysis is considered in project pre-planning and an identified risk contingency reserve may have been established in the project budget. Risks are typically defined in the initial business case at a high level because specific deliverables may not have been defined and many of the details are not known. Similar projects that have been completed can often provide an initial sense of project delivery risks.
- **Project Delivery Plan** – The RMP is a document summarizing how the risk related activates are structured and performed on a project. The RMP is defined and documented in the PDP. As with the other plans in the PDP, the RMP is continually updated with each project phase. As projects progress, many of the risks are eliminated and retired as part of the RMP process.

5.9.1 Prepare a Risk Management Plan (RMP)

The PM produces an RMP and manages it throughout the project. The RMP is regularly updated and reported to the project team, Project Sponsor, Project Advisory Committee or Major Capital Project Steering Committee.

The type of Risk assessment as identified below depends on the complexity of the project.

- **Risk Assessment –** Small, routine low-risk projects require only a risk register, which is used exclusively to identify potential risk events and responses. The risks are identified by the PM or delivery team, or extracted from other sources requiring only a low level of effort. Refer to Table 5-14
- **Qualitative Risk Assessment –** A qualitative risk assessment is used for projects that are not small or routine however are not of significant concern. A short-form numerical approach and risk identification method may be used. The risks are identified by the PM or delivery team, or extracted from other sources requiring only a low level of effort.
- **Comprehensive Qualitative Risk Assessment –** A comprehensive and detailed qualitative risk assessment must be completed for projects that have medium to high risks. Detailed scoring and a risk ranking for each risk event is required. A more formal process with participation of a broad range of stakeholders is used, typically in a workshop setting.
- **Quantitative Risk Assessment –** High-risk projects, or those identified by the Major Capital Project Steering Committee, require quantitative risk assessments.

The RMP must address project delivery risks as well as product risks. Just as risk to project delivery may cause costly overruns or start-up delays, risk to the product may cause a poorly functioning product or costly re-work that may far exceed the consequences of project delivery risk. Separating project delivery risk and product risk allows focus and discipline to be maintained for both.

- **Project Delivery Risk** – Project delivery risk addresses threats to project delivery in terms of scope, cost, schedule, and quality. Examples are inadequate budgeting, inadequate resources, or excessive demands from stakeholders.
- **Product Risk** – Product risk addresses the product implementation and the product's function. Examples include uncertainty of soil conditions, a shortage of skilled contractors, and use of unproven technology.

Product risks are more likely to be identified by technical staff or others experienced with the product. A separate risk analysis process such as a workshop convened later in the project may be used. Product risk RMPs are updated with a different frequency than are project delivery RMPs.

Risk responses must be identified as part of the risk management process, either during or after the risk assessments. The RMP also identifies the frequency of or triggers for risk reassessments.

The PM is responsible for tracking all risks with summary reports submitted to the Major Capital Project Steering Committee and manager of capital projects. The Major Capital Project Steering Committee is directly involved in reviewing risks, as indicated in FM-002. RMP updates are included in quarterly reporting on major capital projects and are required for project phase gate approvals.

The RMP should also consider opportunities, which are simply risks with positive impacts. Although not described in detail in this PMM, the processes and procedures for considering opportunities are similar to those for considering threats.

5.9.1.1 How to Prepare a Risk Management Plan

The RMP accompanies the PDP and documents the results of risk planning. It defines how to conduct risk management, so that the process is commensurate the risks and importance of the project and the information is available to project stakeholders. It will depend on the complexity of the project (refer to section 1.5) and as a minimum is to include:

- Project description
- RMP scope and reference to WBS deliverable
- Organization, roles and responsibilities
- Risk management methodology
  - Evaluation approach
  - Tools
- Reporting
- Risk register

5.9.2 Risk Statements

Properly structured risk statements aid in developing and tracking the responses. Fundamental concepts used in risk statements are:

- A **Cause** is the condition that exists in the project and gives rise to the threat (or opportunity); one cause may generate multiple threats (or opportunities)
- The **Risk** is the event that may or may not occur
- The **Effect** is the unplanned impact on at least one of the project objectives

The above concept has been embedded into the Risk Management Plan template.

5.9.2.1 Risk Management Plan Template

A template for the Risk Management Plan is provided in Appendix B.

5.9.2.2 How to Identify Risks

Every project is exposed to multiple risks of different types. The risks may relate to either or both of the project or product, and affect any of the four project objectives, scope, cost, schedule and quality. It is useful to categorize risks prior to attempting to quantify them or develop risk response strategies.

A recommended practice provided in AACE No. 42R-08 defines risk into two categories: risks that have systematically predictable relationships to overall project cost growth (systemic) and those that don't (project-specific). Table 5-14 provides examples of the Risk Categories for the two risk types.

Table 5-14: Examples of System and Project-Specific Risk

Examples of Risk Type and Categories of Risk		
Risk Type	**Systemic Risks**	**Project-Specific Risks**
Category of Risk	Design Complexity • Technology • Process Complexity • Material Impurities Project Definition (how defined) • Site/Soils Requirements • Engineering and Design • Health, Safety, Security, Environmental • Planning and Schedule Development Project Management and Estimating Process • Estimate Completeness (due to scope definition) • Team Experience/Competency • Cost Information Available • Estimate Bias	• Weather • Site Subsurface Conditions • Delivery Delays • Constructability • Resource Availability • Project Team Issues • Quality Issues (e.g., rework)

- **Systemic Risks -** The term systemic implies that the risk is a product of the project "system", culture, business strategy, process system complexity, technology, and so on. Measures of these risks are generally known even at the earliest stages of project definition and, furthermore, the impacts of these risks tend to be highly dominant for early estimates. However the ability to directly estimate these events is difficult. (For example, the cost of a complex design cannot be clearly quantified but identification that there is a risk is possible). Finally, systemic risks tend to be "owner" risks; i.e., the owner is responsible for early definition, planning, technology, and decisions so these risks cannot be readily transferred.

- **Project Specific Risk -**The impacts of these risks are not highly predictable between projects within a system or within an industry as a whole. For example, rain may have much more impact on one project than another depending on the project characteristics and circumstances. Measures of these risks are generally not known at the earliest stages of project definition. The link between *project-specific* risks and cost impacts is more deterministic in nature; i.e., they are related to individual understanding and to estimating the impact of these risks on particular items or activities (for example, the risks of excess rain on something like site preparation or concrete foundations can be estimated). These risks are more negotiable during project contracting strategy as to who will carry them.

Individual risk may be identified by the PM, or for larger projects a team of experts should be used. After the risk identification process the details of the individual risks are then listed on a risk register for managing and tracking.

5.9.2.3 How to Create a Risk Register

A risk register is required for all projects. A risk register includes:

- **Project objective –** All project objectives (scope, cost, schedule, quality) are considered in the risk assessment. The risk register includes a column listing the objectives to prompt consideration of each. "N/A" should be written if there are no risks for an objective.
- **Threat or opportunity –** Risks can be either unfavourable to the outcome, in which case they are threats, or favourable to the outcome, in which case they are opportunities. The risk table indicates which type the risk is expected to be.
- **Meta language risk descriptions –** The risks should be described with a three-part "metalanguage" description in the form of "As a result of < definite *CAUSE*>, < uncertain *EVENT*> may occur, which would lead to < *EFFECT* on objective(s)>". This approach promotes separation of the cause and effect from the risk.
- **Risk response –** A risk response must be identified for each risk.

An example risk register form is shown in Table 5-15.

Table 5-15: Basic Risk Register

Risk Event Identification					**Risk Response**	**Risk Response Owner**
Project Objective	Threat or Opportunity?	As a result of (*Risk Cause*)	This event may occur (*Uncertain Event*)	Which leads to (*Effect on objectives*)	This <*Response*>	
Scope						
Cost						
Schedule						
Quality						

Risk registers for more detailed risk assessments include additional columns, such as a formal referencing system, and likelihood and consequence scores.

5.9.2.4 Risk Register Template

The Basic Risk Register template is embedded in the RMP (short form) template provided in Appendix B.

5.9.2.5 How to Prepare a Qualitative Risk Assessment

A qualitative risk analysis is carried out by estimating the likelihood (probability) of each risk to occur and the consequences (impact) if it does. The two scores are then combined and the risk is prioritized. An

example of a probability scale is provided in Table 5-16 and an example of a consequences scale is provided in Table 5-17 for a basic qualitative risk analysis.

Table 5-16: Basic Risk Probability Scale

Score	Likelihood/Probability	Description
5	Almost Certain	Is expected to occur unless circumstances change
4	Likely	Will probably occur in most circumstances
3	Possible	Might occur under current circumstances
2	Unlikely	Could occur if circumstances change
1	Rare	May occur only in exceptional circumstances

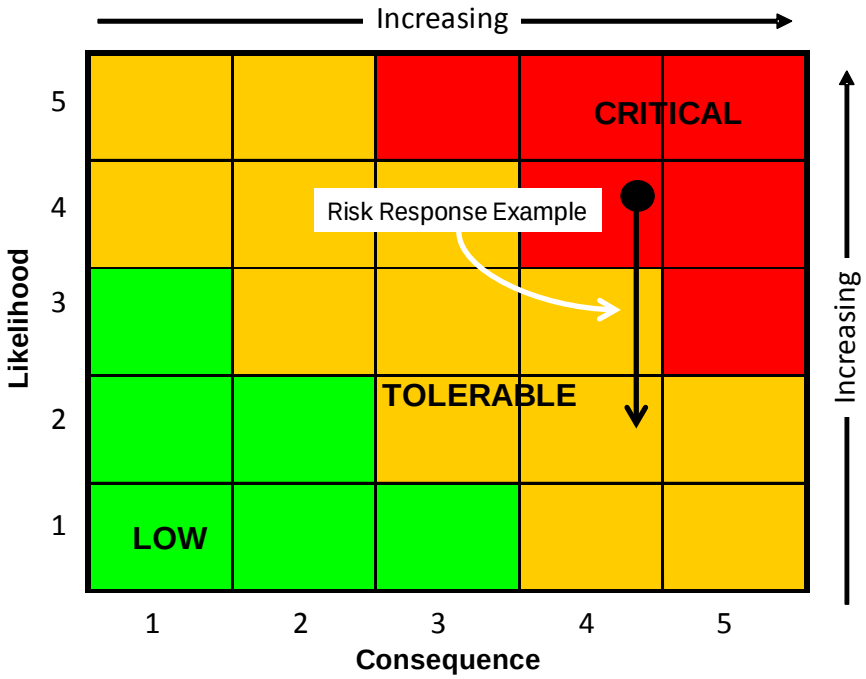
Table 5-17: Basic Risk Consequences (or Impact) Scale

Score	Consequence/Impact	Description
5	Extreme	Heavy damages
4	Major	Significant damages
3	Moderate	Serious damages
2	Minor	Minor damages
1	Insignificant	Insignificant damages

Risks may be identified and scored by the project team, stakeholders, or others with related experience. The Major Capital Project Steering Committee may also identify risk, as its members can draw on experiences from other large City projects. A typical method of capturing the information is through team brainstorming sessions. A process for conducting this analysis should be developed and agreed on by the team for each project, commensurate with the project needs.

Probability and consequence scores can be plotted in a matrix, as illustrated in Figure 5-9.

Figure 5-9: Example of a Qualitative Risk Matrix (Illustrating a Planned Risk Response)



As shown in Figure 5-9, a risk matrix indicates the level of risk and basis for risk prioritization. Risks with a combination of high likelihood and high consequences will be of the most concern. A risk response will be required to manage critical risks. In many cases the risk response will only address either the likelihood or the consequence. Figure 5-9 shows risk response decreasing as likelihood decreases.

5.9.2.6 How to Prepare Quantitative Risk Assessment

Quantitative risk assessments are prepared after the risks have been identified and rated through the qualitative process. A quantitative assessment is used for cases where the risk will be accepted or it has been determined that a contingency allowance should be applied. The individual risk contingencies are then compiled and itemized into the risk reserve contingency. Refer to Section 5.0 for application of the risk reserve contingency to project estimates.

The factors that affect the quantification of the risk reserve are complex and by necessity or for convenience a lot of assumptions are usually made. It is important to note:

- The risk reserve is to be added to the phase estimate with the estimating contingency included, however, do not double count any risks already considered.
- It would be incorrect and a budgeting error to set the contingency amount as the total of all of the potential risks, since it is unlikely all risks would occur on any one project at the same time, and the potential for realization of opportunities would be overlooked.
- The contingency must reflect the stakeholders risk tolerance level.

The method of risk quantification will depend on the category of risk and the project needs. Three alternative methods are identified in the following for quantification of the risk reserve:

1. Single-Point estimate

In single-point estimating the estimator assigns a fixed contingency or percentage risk reserve value to a single-point estimate. For systemic risks the value may be determined through intuition, experience or from historical data. For project-specific risks the Expected Monetary Value (EMV) approach is used:

- EMV requires the probability of the event to be estimated as well as the monetary consequences. The amount of the contingency is then determined by the multiplication of the two values.
- The EMV estimates are improved by applying different contingency percentages to each major cost element. This recognizes that some parts of the project may have greater uncertainty than others. This method is considered more rational and reliable than the simple application of one overall percentage to the total cost because it encourages closer examination of each cost area

The calculated amount is the risk reserve contingency to be added to the estimate, and is managed as a separate line item through the contingency management process.

This single-point method is easy to apply, and is satisfactory for projects where there may be a substantial amount of experience with the type of project to justify the approach. The drawback is that the single-figure prediction of estimated cost implies a degree of certainty that is not justified. The probability of achieving this cost is not fully evaluated and does not take into account the surrounding uncertainty.

The single-point method may be used for smaller projects, and at the first phases of larger projects. It is not suitable for large and complex projects.

2. Three-point range estimate

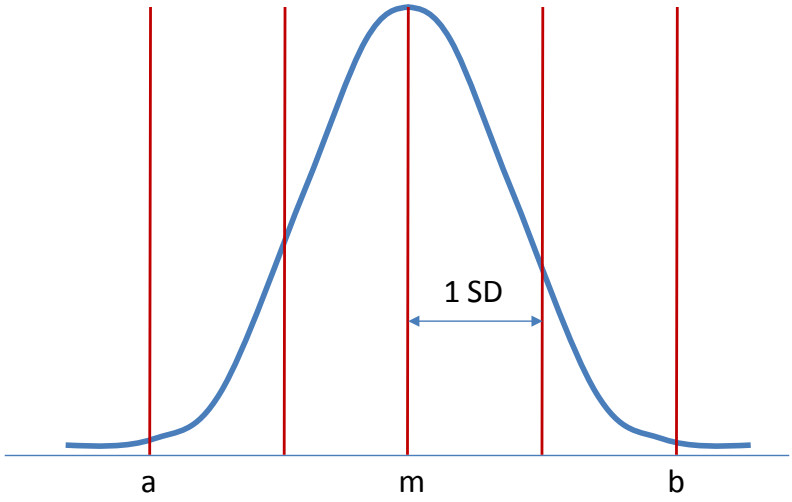
Range estimating provides a simple quantitative method of risk assessment. It is based on an assumed probabilistic distribution of the cost estimates, providing an improved prediction of the actual uncertainty and justification for the contingency values as compared to the single-point method.

The three-point technique can be used for any type of estimate, either at the project or component level. In its simplest form it only requires that three estimates be prepared at the project level:

- a = Best case estimate - is the value where there would only be a 5-10% chance of a lower value
- m = Expected value - is normally the estimated value, and the most likely case, prior to risk allowances being applied
- b = Worst case - is the value where there would only be a 5-10% chance of a higher value

The technique assumes that the resulting relationship is a normal distribution, which is represented by a bell curve as shown in Figure 5-10.

Figure 5-10: Probability Distribution based on the Three-Point Range Technique



When a single three-point estimate is used the expected value is equal to point “m” and the standard deviation (SD) can be calculated as:

SD = (b-a)/6

Confidence levels can then be determined from the SD:

- there is a 68% probability the estimate will fall within one SD higher or lower than the estimate
- there is a 84% probability that the project will cost less than the estimate plus one SD

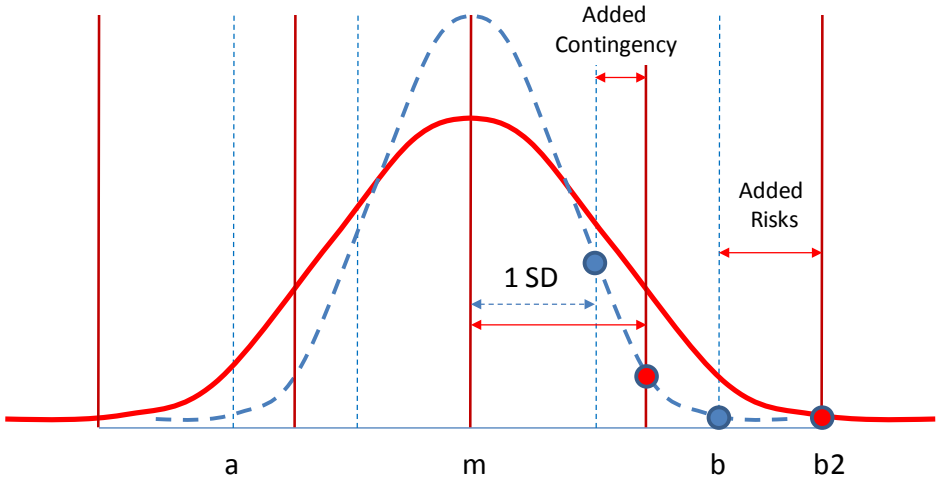
This method can be applied directly for systemic risks, with or without use of the risk register. The best and worst case estimates can be developed from prior experience, educated guesses, or more preferably from the risk register results.

Accuracy of the estimate is improved by applying the technique to a number of component estimates for multiple deliverables, rather than at the project level. This is done by:

- Selecting deliverables with the highest risk and potential variation
- Developing cost estimates for the selected deliverables and their SDs
- Calculating the total project estimate by summating the component estimates
- Calculating the total project SD by taking the square root of the summation of the squares of the SDs

The project-specific risks from the risk register can be added to the systemic risk contingency. This is done by modifying the best and worst case point values and recalculating the SD, as shown in Figure 5-11.

Figure 5-11: Three-Point Range Estimate with Project-Specific Risks



The risk consequences from the risk register are totalled and added to the worst case estimate (new point "b2"). A similar adjustment should also be made for the best case (opportunities) and their potential cost reductions. The resulting distribution is assumed to remain to be "normal" and the contingency allowance can be calculated as described previously with the new values.

The accuracy of the estimate is improved if multiple component estimates are used rather than at the project level, with the individual risks applied to their respective deliverables.

The three-point range estimating method doesn't define the cumulative risk reserve value, however provides a rational basis for its selection, based on the desired confidence limits. This would be determined from the organization's budgeting strategies and tolerance for cost overruns. The approach and contingency value selection are to be reported in the basis of estimate.

The calculated risk reserve contingency is added to the estimate, and is to be managed as a separate line item through the contingency management process.

3. *Monte Carlo Simulation*

The Monte Carlo simulation method (MCS) is a more sophisticated quantitative technique for analyzing risk and quantifying the contingency value. As with the three-point range estimate, the output of MCS is a probability distribution for total cost of the project.

The MCS requires a higher level of input definition and uses a series of calculations in computing the results. It is typically carried out by experienced estimators using commercially available software, and its specific application is not included in this manual.

The MCS should be considered for large complex projects.

5.9.2.1 Qualitative Risk Assessment Template

The Qualitative Risk Assessment template is embedded in the Risk Management Plan template provided in Appendix B.

5.9.3 Risk Response Plan

Risk responses are developed after the risk events have been identified and prioritized. Not all risks require formal risk response plans. The level of effort to identify response strategies and follow-up risk management depends on the level of risk.

5.9.3.1 How to Develop Risk Responses

Risk response strategies can be applied to the cause, the risk, or the effect, and are described below.

Avoid – A threat can be avoided by removing the cause or breaking the cause-risk link. For example, if use of unproven technology causes a risk, the risk could be avoided by using a standard approach.

Transfer – Transfer does not change the true likelihood or consequence of a threat however relieves the City of responsibility for it. Insurance and performance bonding are examples of risk transfer.

Reduce – A threat can be reduced by addressing either the cause or the effect, and either the likelihood of the threat or the consequences of the threat can be reduced. This could include additional work to reduce the risk.

Accept – Some threats are too difficult to attempt to control, and must be left to chance. In this case neither the likelihood nor the consequences can be reduced and the response is to deal with the effect if it happens. Providing a risk contingency reserve is the main response to this threat. Often “Plan B” contingencies should be considered and developed as well.

Higher order RMPs must include detailed risk response plans that also identify the risk response owner, response triggers, managing contingencies and a schedule for actions, reviews, and reporting.

5.10 Plan Integrated Change Control

5.10.1.1 For Integrated Change Control see section 7.0

5.11 Plan Health, Safety, Security, and Environment

The Manitoba Workplace Safety and Health Act (WHSA) require employers to develop workplace safety and health criteria to evaluate, select and monitor contractors working at the workplace. Details can be found on the City’s website at http://www.winnipeg.ca/matmgt/Safety/default.stm. An additional CityNet site for internal City Contract Administrators can be accessed through http://citynet/hrintra/workplacewellness/Safety/Safety-MainPage.stm

The City of Winnipeg process applies to Contractors who perform work for the City in the following circumstances:

- Construction contracts with an estimated cost greater than $100,000 or considered to have high safety risk by the City and
- Non-construction contracts considered to have high safety risk by the City.

5.11.1 Contractor Safety & Health Program Evaluations

The City's process requires bidders on affected Bid Opportunities, to submit, within 5 business days of a request by the City, proof of an "acceptable" safety and health program. Bidders who cannot provide this proof are not awarded the contract.

"Acceptable" means that the program meets or exceeds the elements required of a safety program as outlined in Section 7.4(5) of the Workplace Safety and Health Act.

Proof of an acceptable safety and health program is considered to be one of the following:

1. **Written confirmation of a Manitoba COR™ or SECORTM program:**

    - Manitoba COR™ or SECORTM companies must submit a copy of their certificate along with their most recent letter of good standing to their assigned Contract Administrator. If a Contract Administrator has not yet been assigned, this information is to be sent to the designated City contact person.

2. **Written evaluation and verification by an independent workplace safety and health consultant:**

    - Bidders/Contractors can meet the requirement for independent verification without obtaining COR™ or SECORTM by providing written confirmation from an independent workplace safety and health consultant satisfactory to the City.
    - The safety and health program review is conducted using the Contractor Safety & Health Program Evaluation Document, and is based on the requirements of Manitoba's Workplace Safety and Health Act.
    - Independent workplace safety and health consultants satisfactory to the City include persons who:
        - have been approved to conduct COR™ or SECORTM audits; or
        - hold certification such as Canadian Registered Safety Professional (CRSP) or equivalent

5.11.2 Safe Work Plans

Before work begins, a Safe Work Plan is developed by the Contractor in consultation with the Contract Administrator.

To ensure the Safe Work Plan includes consistent safety and health information, the Contractor may be required to use the City's Safe Work Plan Document.

The Safe Work Plan demonstrates that a Contractor:

- Is aware of the hazards associated with the work; and
- Has identified appropriate control measures to manage the hazards.

The Contract Administrator reviews the Safe Work Plan with the Contractor and requests clarification from the Contractor as required. The Contract Administrator can request assistance from their departmental safety resource as required. The Safe Work Plan is to be provided to the Contract Administrator within the time frame mentioned in the contract. The time frame is usually at least 5 days before the work is scheduled to begin.

5.12 Plan Commissioning

Planning for commissioning is included in the PMM because of its significance in the AMMS. Commissioning requirements may be product-specific, and the PM should communicate with the Business Owners and

experts in its development. However, commissioning planning may not be applicable to all projects, and, as with other processes, it should only be applied as necessary.

Early consideration of commissioning is important so that assets can be transferred to operations, where coordination of a number of parties is required, including the Business Owner, Operator, Consultant, Contractors, trades people, utilities staff, suppliers, permitting agencies, and, potentially, third-party testing and commissioning firms.

Coordination may also be needed for operating expertise, documentation, training, operating supplies, temporary services and testing, and budgets for the transition and for management of the transition services.

5.13 Plan Close-Out

Close-Out is included in the PMM as a process to be planned under the planning process group. Close-Out planning should identify which tasks, deliverables, and phases can be closed and when, as well as the resources needed for their closing. The PM is responsible for confirming that all required work and deliverables have been completed prior to the close-out and that all documentation is in place.

The PDP needs to integrate the following into the Project's phase or project close-out deliverable and tasks:

- A business case update for the Project Sponsor's consideration prior to beginning of the next phase.
- After each phase however especially at the execution phase stage gate with completion of a class 3 estimate, the Sponsor (and Business Owner) need to assess whether the investment (project) should still proceed. This assessment includes multiple factors such as value for money, risk assessment and level of service - willingness to pay target (criteria). See the Closing process for details.
- Confirmation that products, services, or results are being transferred to the next project phase, or (upon completion of the project) to the Business Owner
- At the end of the project, a "lessons learned" discussion, which provides information to support the City's continual improvement process
- At the end of the project, a benefits realization report

5.14 Update Project Delivery Plan

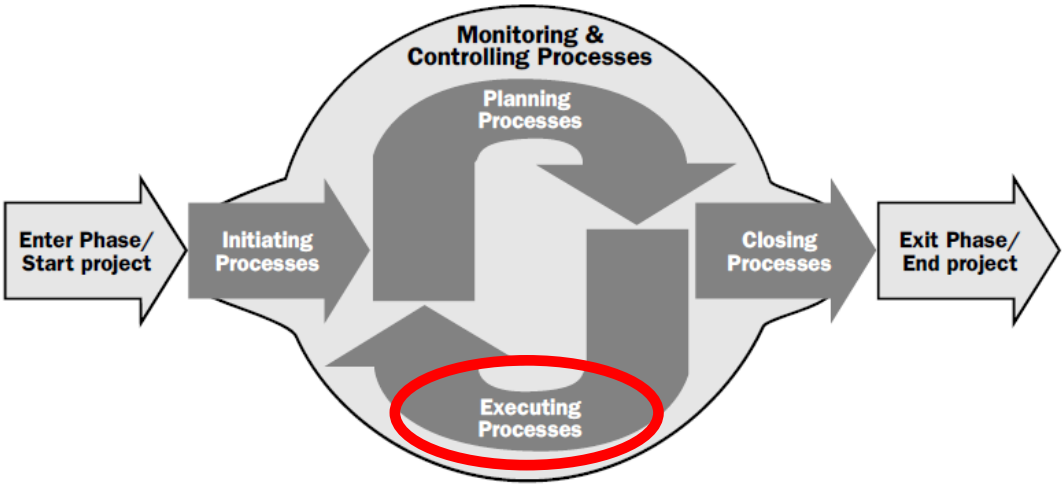
The PDP must be updated as one of the initial activities of each phase.

5.15 Plan Tangible Capital Asset (TCA) Updates (Under Development)

Public accounting rules require capital assets to be identified and tracked. The City is developing procedures for tangible capital asset accounting that integrate into the PM Framework.

6 Executing Process Group

Executing is the third of the five project management process groups. The executing process group includes processes for executing and updating plans developed in the initiating and planning process groups.



6.1 Acquire Project Team

The PM, in consultation with the Project Sponsor, is responsible for identifying candidates to fill the roles identified on the project organization chart. For senior positions and most support functions, the roles are filled by personnel who already have organizational responsibility for a related function, and a candidate selection process is not required.

For the Project Advisory Committee, a broad cross-section of the organization should be represented to provide objective advice, guidance, and recommendations for decision-making. A committee consisting of only end users or customers may not be impartial about options and may cause the decisions to deviate from the business case.

For situations in which a selection process is required, such as for filling roles with personnel from the private sector, careful consideration must be given to matching the candidate's qualifications to the project needs. Many projects have positions, especially for the technical roles, for which certification is required, and most projects benefit from selection of well-qualified personnel. Lack of qualified staff should be considered a project risk and should be addressed under the risk management process.

6.2 Develop Team Charter

The project team uses the process of team chartering to define itself. Team chartering takes place early in the project, however, after the PDP has been developed and approved and the team members have been selected. The main goal of team chartering is to increase the probability of success.

A project may have multiple team charters, with the initial charter developed during the planning phase for City team members. The internal team chartering does not involve consultant team members, however, Consultants normally hold another chartering session once retained that involves internal and external team members.

Team chartering informs the team of the project plans and defines their roles and expected participation while increasing cohesion, alignment, and motivation. The process benefits the project by:

- Defining the project objectives for the team
- Identifying and clarifying team member roles, responsibilities, and authority
- Defining expectations
- Building agreement on how the team will function
- Building a common vision and goals
- Empowering team members
- Motivating the team

The benefits of chartering far outweigh the costs, and results in team behaviours that are stronger than individual behaviours and make better use of resources. Team chartering makes it possible to achieve far more than if each team member were performing merely as an individual.

6.2.1.1 How to Develop a Team Charter

The project charter identifies how the team will work together to achieve the objectives of the project as outlined in the PDP. The PM leads the team chartering process however all team members provide their written endorsement of the team charter and take ownership.

Team charter topics include:

1. Review Project Charter
2. Team purpose
3. Project Organization Structure (from the PDP)
4. Team membership (from the team acquisition process)
5. Roles, responsibilities, and authority (from the PDP)
6. Measures of team success
7. Issue resolution process

6.2.1.2 Team Charter Template

A template for a Team Charter is provided in Appendix B.

6.2.1.3 Team Chartering Workshop

A team meeting is an important component of team chartering. The meeting brings team members together to focus on common project goals and begins the team-building process. The team chartering session must be tailored to the size of the project. A generic agenda for a team chartering session is:

1. Introductions
2. Purpose of team chartering
3. Project description
4. Project Organizational Structure
5. Project Delivery Plan (PDP)
6. Team roles, responsibilities, and authority
7. Issue resolution process
8. Critical success factors
9. Non-team chartering topic
10. Team Charter endorsement

6.2.1.4 Endorse the Team Charter

It is imperative that the team charter be endorsed and signed by all team members. Endorsing the team charter is part of the team-building exercise and builds a sense of ownership and commitment.

6.2.2 Update the Team Charter

A team charter is required from the time of the team's development in the planning phase to final project close-out. The team charter must be updated at the beginning of all execution sub-phases, as well as at the beginning of the close-out phase, since new staff may be involved at any time, or the project may change.

6.3 Manage Project Team

Managing the project team is the process of engaging and communicating with team members, developing the team, building relationships, fostering teamwork, motivating the team, coordinating input and feedback, resolving issues, and celebrating successes.

Managing the team is one of the PM's greatest and often most challenging responsibilities. The PM must have the confidence to lead a team that in many cases includes senior members with more authority, more knowledge of the operation, and greater product knowledge and technical skills than the PM. In other situations, the PM must have the diplomacy to deal with junior members with less experience and knowledge, even in their own area of responsibility, than the PM. The PM must be prepared to deal with a variety of team structures and team dynamics and dedicate the time and effort to the team's success.

6.3.1.1 How to Manage the Project Team

The first and most effective ingredient for team management is selection of a PM with well-balanced leadership, business, and interpersonal skills. Team members with similar characteristics also benefit the team, however as with most groups a wide variety of personality types is likely. A well-structured PDP has the following features to promote team success:

- Team chartering intended to address team-building directly by aligning the team to common goals and providing clarity for each team member's role
- Clear direction and effective and transparent decision-making, as identified in the Project Organizational Structure, to aid in team buy-in and ownership
- An issues log so team members are clear on expectations

The PDP should be supplemented by the following PM and project team actions:

- The Project Sponsor should be a project champion and provide visible support
- The PM must provide regular and frequent communications to keep the team informed
- The PM should include Consultants in team-building and encourage them to adopt the same team strategies
- A conflict management approach should be developed for handling challenges
- All team members should strive for consistent positive thinking and celebrate successes as a team

6.4 Conduct Procurement Solicitations

As discussed in Section 5.6, most procurement for large projects will be through solicitation of competitive offers. This section defines the processes for selecting a Consultant and a Contractor. The City defines the

term “bidder” to mean any person submitting a Bid for the Work and “Consultant or Contractor” to mean the person undertaking the performance of the Work. Processes for other delivery methods, whether P3 or another form of an Alternative Project Delivery, may have special requirements not addressed in this PMM.

6.4.1 Prepare Request for Proposals (RFP)

An RFP is an invitation for bidders to submit proposals to the City to perform specific work, while the vendor’s proposal in response to the RFP is an offer of the services. Two common approaches to the proposal process are single-stage and two-stage requests.

A single-stage request is the most common approach, with the request for qualifications and the technical approach all included in one RFP.

The two-stage process separates the qualifications from the technical submissions and is typically only used in specific situations, usually to reduce the number of RFP submissions on large and complex projects. The first stage is a request for qualifications. After evaluation, the submissions are shortlisted based on pre-defined criteria. A general scope of work is required for the qualifications stage and submissions are not expected to have a work plan or costs. The second stage, for the technical and cost submission, is restricted only to proponents shortlisted in the first stage.

The RFP must define the City’s expectations, including the detailed scope of work and terms and conditions under which the offer is to be made. The City has GCs that are a set of standard terms and conditions for use in RFPs. They are periodically updated, and are available on the City’s website at http://www.winnipeg.ca/matmgt/gen_cond.stm. When the GCs are identified early in the process, the bidders are aware of the requirements and can accommodate them in their proposals.

The City uses a standard template for RFPs that can be found on the City’s website at http://www.winnipeg.ca/matmgt/templates . The template incorporates the GCs and includes bidding procedures and forms to standardize and simplify the RFP’s preparation. The template requires proposals to be submitted prior to the submission deadline.

A fundamental feature of the RFP process is competition. The competitive nature allows equal access to public projects for all applicants and at the same time guarantees competitive pricing.

6.4.1.1 How to Prepare a Request for Proposals

The first step in preparing an RFP is to access the City’s website for up-to-date documents. The PM is responsible for RFP preparation, including identifying requirements, preparing the document, coordinating selection team input, issuing the request, and communicating with bidders.

The RFP template is structured into the proposal submission forms, bidding procedures, GCs, supplemental conditions (SCs), and specifications. The template provides a basic format, and the user enters project-specific inputs.

Some key inputs are:

- **Scope of Work –** The major and most critical effort in preparing the RFP is developing the scope of work. A well-defined project scope is the cornerstone for a responsive proposal. The scope of work is developed from the statement of work in the Project Plan, which reflects the intent of the business case. The structure of the scope of work depends on the nature and intent of the project:
  - A prescriptive approach can be used when the methods and deliverables are clear and there is little advantage in pursuit of alternative and creative solutions.

  - A performance-type scope is appropriate for projects that would benefit from creativity, industry experience, initiative, and innovation.

- **Evaluation Criteria –** The RFP must identify the intended criteria for evaluation. Sample criteria from the template and their weights are shown in Table 6-1. The RFP template may list the minimum weights to give various components of the RFP.

Table 6-1: Sample Evaluation Criteria and their Weights from the Request for Proposal Template

Evaluation Criterion	Weight (%)
Fees (minimum)	40
Experience of proponent and sub-consultants	20
Experience of key personnel assigned to the project	10
Project understanding and methodology	20
Project schedule	10

- **Indemnity –** The GCs include an indemnity clause to protect the City against negligent acts, defects, errors, or omissions of the Consultant during the performance of the contract.
- **Insurance –** Consultants/Contractors are required to carry insurance policies, with the minimum requirements identified in the bid opportunity. The Corporate Finance, Risk Management Division must be contacted about any revisions. Special considerations for wrap-up policies with errors and omission coverage are discussed in Section 6.4.3.
- **General Conditions** – The GCs cover a number of standard boilerplate requirements. If the RFP requires exceptions to the GCs, they are stipulated in the SCs without altering the GCs, and the SCs then take precedence over the GCs.

The PM is responsible for coordinating advertising and submission with the Materials Management Division. The procurement solicitation process is the same for all types of projects, with some variation in the procedures depending on whether an RFP or bid opportunity is used. The process for soliciting and receiving bids is described in more detail in Section 6.4.3.

6.4.1.2 RFP template

The City uses a standard template for RFPs that can be found on the City's website at http://www.winnipeg.ca/matmgt/templates.

6.4.1.3 How to Make a Single Source Procurement

The justifications for single source procurement are detailed in B4 of the Materials Management Policy and must be in accordance with Administrative Standard FM-002.

6.4.2 Evaluate Proposals and Award Contracts

Competitive proposals received from bidders must be treated equally and evaluated fairly in accordance with the evaluation criteria and methods stipulated in the RFP. The proposals are evaluated by an Evaluation Committee, which must commit to proposal review, scoring (individual and consensus) and attendance at interviews, if applicable.

Proposal scoring includes both financial and non-financial criteria that are combined into a single score. The City uses a standard scoring matrix that incorporates technical scores and fees into one combined value. The evaluation approach is available from the City's website at http://www.winnipeg.ca/matmgt/templates/Bid_Evaluation/Bid_Evaluation.stm.

In some cases interviews may be necessary. The interviews are for clarification and demonstration of aspects of proposals and must be used with caution. Interview protocols should be defined by the Evaluation Committee in advance and applied consistently throughout the process.

The final step of bidder selection is a debriefing to provide feedback to the bidders on their submissions, if requested in writing. This must be tactfully managed, as it typically involves negative feedback. A method that demonstrates objective scoring for defined criteria is the best way to approach the situation. Be aware that you can only share information about the evaluation of the bidder being debriefed. Do not provide the bidder with a copy of the evaluation matrix.

6.4.2.1 How to Evaluate Proposals and Make Awards

The PM is responsible for coordinating the proposal reviews, scoring, and final evaluations, and for preparing the award recommendation. The approach for evaluating proposals and recommending award is:

- Proposals are received in the Materials Management Division, where they are recorded, checked for obvious irregularities, and forwarded to the PM.
- The PM reviews the proposals for irregularities and responsiveness.
- The Evaluation Committee is assembled and proposals are distributed.
- Evaluation Committee members independently review and score all proposals according to the evaluation criteria and scoring method in the evaluation matrix.
- The PM contacts company references, if applicable, and documents findings.
- An Evaluation Committee consensus meeting is held to discuss merits and anomalies of each proposal and identify potential points needing clarification. This consensus meeting may be repeated based on the results of any clarifications, interviews or demonstrations.
- Clarification letter must be vetted through Materials Management.
- All Evaluation Committee members must attend interviews, if applicable.
- At the consensus meeting, the PM or designate, records the consensus non-financial scores, and justification for each score.
- The PM or designate, combines financial and non-financial scores to determine proposal total scores.
- The proposal with the highest combined score is recommended for award. In some cases negotiations may take place prior to award in consultation with Materials Management and Legal Services.
- If the recommended bidder is not the lowest priced bidder a detailed explanation of the reasons for non-award to any lower priced bidders must be provided to Materials Management prior to the award report.

The project team includes corporate administration personnel (from areas such as Materials Management and Legal Services), who provide advice and assistance with irregularities that arise during the process.

Once the proposals have been evaluated, the award process is the same as for all bid submissions, as described in Section 6.4.4.

6.4.3 Prepare Bid Opportunities

The City uses a formal bidding process to solicit offers for a wide variety of purchases, in addition to offers of consultant services. These offers include bids for construction contracts, services, and the supply of goods.

All these purchases fall under the Materials Management Policy and are subject to the additional conditions stipulated under Administrative Standards.

Each department that is responsible for either preparing a bid opportunity, in-house or retaining a Consultant to prepare a bid opportunity must ensure that the document has been prepared in accordance with the prescribed format and that the approved forms have been used.

A further requirement is that each PM thoroughly review the bid opportunity before it is submitted to the Materials Management Division to ensure that it is clear and unambiguous, that the information it contains is accurate and complete, and that prescribed formats and forms have been used. Guidance on bid preparation and rules for advertising, handling enquiries, and issuing addenda are given in the following section.

6.4.3.1 Forms and Documents Used in the Bidding Process

The City maintains standard documents, forms, and templates on a central website, including the items described below.

Bidding Procedures

Bidding procedure templates applicable to all Bid Opportunities are available from the City website at http://www.winnipeg.ca/matmgt/templates/Const_Gen_HighRisk_template.stm.

General Conditions (GCs)

GCs are requirements applicable to all Bid Opportunities. The GC area of the City website, at http://www.winnipeg.ca/matmgt/gen_cond.stm, must always be accessed to obtain the most current versions of the documents.

The GCs include contract clauses of general application which can be modified as required in the supplemental conditions. The GCs also define the respective roles and responsibilities of the City, the CA, and the Contractor.

Supplemental Conditions (SCs)

The SCs are the project-specific provisions in the bid opportunity. On projects with underground and surface works, the supplemental conditions section must incorporate the appropriate sections/specifications from the current *Standard Construction Specifications available at* http://www.winnipeg.ca/matmgt/Spec/Default.stm .

Drawings

The drawings section consists of drawings that show the nature and scope of the work to be performed and that have been prepared or approved by the PM and are referred to in the Bid Opportunity documents.

Specifications

The specifications section consists of a written description of the physical or functional characteristics of the work that is to be undertaken by the Contractor, including (without limitation) any requirement for testing or inspection. The role of the specifications is to describe the type and quality of materials and workmanship to be incorporated in the work.

While the drawings present the scope of work in terms of quantities, dimensions, form, and building details, the specifications provide the qualities of materials and workmanship for construction of the work.

Bid Opportunity

The resultant bid opportunity establishes the terms and conditions for the contract. The documents have the following multiple clauses that reduce the City's risk on the contracts:

- **Qualifications –** Minimum qualifications can be stipulated so that only those with experience and capabilities to perform the work will be selected
- **Performance Security –** Performance bonds or other forms of security provide protection against contractual defaults
- **Events of Default –** The GCs are structured to permit the work to continue if there is a legal dispute or terminate the work, if appropriate.
- **Insurance –** Minimum insurance levels are stipulated to protect the City against losses
- **Indemnity –** The GCs include an indemnity clause to protect the City against loss from acts or omission as a result of the Contractor
- **Warranty –** A 1-year warranty is standard in the GCs however may be extended in the Supplemental Conditions. The warranty provides a proving period for the Work.
- **Liquidated Damages –** This clause allows the City to recover its additional costs if the contract is not completed on schedule. The purpose of the liquidated damages clause is to clearly warn all bidders when bidding for the job (and ultimately the successful Contractor), the quantum of loss or damage that the City will suffer and that the Contractor will have to pay the City in the event that the interim completion dates, if specified, are not met or if the dates specified for Substantial and/or Total Performance are not met.

6.4.3.2 How to Select the Type of Pricing for a Bid Opportunity

The City has traditionally used two types of pricing for bid opportunity work: the lump sum (or fixed price) contract and the unit price contract.

Lump Sum Contracts

- In a lump sum contract, the bidders must submit a single price for the complete work on Form B: Prices (Lump Sum). The onus is on the bidder rather than on the City to determine the quantities of materials that will be required to complete the work. The test to determine whether or not the City should use a lump sum contract for bid opportunity work is whether the work can be specified in precise enough detail in the bid opportunity, drawings and specifications to ensure that there will be no possibility of or necessity for additional work.

Arguments for using a lump sum contract are:

- The City will know upon receipt of the bids and following award of contract exactly what the work will cost.
- It is easy to administer, provided that no additional work becomes necessary.
- It requires less administration effort to process progress payments.

Arguments against using a lump sum contract are:

- Unless the work is defined in precise detail and the drawings and specifications are complete, the City cannot be sure the bid/contract price will be the price it must ultimately pay for the work.
- It is difficult to accurately value work-in-progress, and, as a result, there is a potential for under/overpaying the Contractor during the various stages of the construction.
- A lump sum contract requires more administration effort if additional/extra work is encountered.

When preparing a bid opportunity for a lump sum contract, the CA or PM (i.e., the in-house representative or a consultant) must ensure that:

- A payment clause is included in the supplemental conditions section and that the payment clause clearly specifies the basis upon which the City will pay the Contractor. For example, the payment clause should specify when the City will pay the Contractor.
- The bidder is not requested to break down the lump sum price on Form B: Prices (Lump Sum). If the City requires a breakdown of the lump sum price, a clause should be included in the supplemental conditions section that requires the Contractor to provide the breakdown within a specified period of time after the award of contract.

Unit Price Contracts

For a unit price contract, the bidders are required to submit individual prices for specific items (material or segment) of the work. The individual prices may be based on either a “unit price” or a “lump sum.” A lump sum price for an individual item should be used only under the same conditions provided in the section above.

Arguments for using a unit price contract are:

- The City can estimate the cost of the work by multiplying the approximate number of units by the price bid for each unit.
- It is easy to administer, especially in terms of determining the cost of extra work.
- It requires a minimum number of people to administer it.

Arguments against using a unit price contract are:

- The work must be precisely broken down into individual items.
- The drawings and specifications must be complete, except for a final determination of the quantity of work to be performed.
- If the City has grossly underestimated or overestimated the quantities, the Contractor may have remedies available under the contract.
- The CA must be able to measure the quantity of work performed.

When preparing the bid opportunity for a unit price contract, the CA or PM (i.e., the in-house representative or the consultant) must ensure that:

- Quantities, although expressed as approximations only, are as accurate as possible.
- Each type of work described in the specifications section is included as an individual item in Form B: Prices (Unit Price)

The unit price contract has particular application to heavy construction for which exact quantities cannot be determined in advance (for example, excavation of subsurface material).

6.4.3.3 How to Prepare Bid Opportunities

For DBB projects, the Consultant or in-house design staff develop designs, drawings, and specifications for products or components during the project planning phase and assemble the information and requirements into bid opportunities for advertising and receipt of bids.

The type of bid opportunity to be used depends on what is being procured and whether there are any unique procurement requirements. The City's website has a page that helps users navigate the decision-making process to find the specific application developed to help in preparation of a bid opportunity: http://www.winnipeg.ca/matmgt/templates/decisions/Contract_Type_decision.stm.

The bid opportunities must incorporate a set of the City's GCs. Like the GCs for consultant services, other GCs are a set of standard terms and conditions for use in a specific area. They are periodically updated, and are available on the City's website at http://www.winnipeg.ca/matmgt/gen_cond.stm.

The website lists multiple versions of the GCs and the user must select the current version. Multiple versions of the same GCs may be posted. This is because revisions to the GCs are not retroactive to contracts that have already been awarded, and whichever version was included in the contract remains in effect. New bid opportunities must use the most recent version.

The City uses standard templates for each of the bid types. The website offers templates for various types of infrastructure that are applicable to DBB projects. A template for general construction (referred to as *Construction Complex Projects Contract*) and the conditions under which it applies can be found at http://www.winnipeg.ca/matmgt/templates/Const_Gen_HighRisk_template.stm.

The general construction template and others are formatted with hidden instructions to guide the user through preparation. The document references the GCs and the specifications and drawings to be appended to the document to form the bid opportunity.

The bid opportunity documents include multiple terms and conditions and contractual requirements that impact the project management processes. The bid opportunity document is normally prepared by the Consultant or in-house, however the PM, and project team must review it and provide input.

Construction contracts are normally structured as lump sum or unit price contracts. Evaluation criteria may be used, however this occurs infrequently because the work is usually specifically defined with little opportunity for other criteria impacting the bids.

The PM coordinates a review of the bid opportunity prior to advertising. The review is to check conformance to the bidding process, bid documents, and procedures.

A template for the Bid Opportunity is provided on Materials Management website.

6.4.3.4 Cardinal Rules for Bid Opportunity Preparation

Five cardinal rules must be followed when preparing a bid opportunity, as described below.

Provide Accurate Information – It is the City's responsibility to ensure that all information included in the bid opportunity is accurate.

When the City prepares a bid opportunity in-house or retains a consultant to prepare a bid opportunity on its behalf, the City or Consultant must ensure that the document includes the best information in the City's/Consultant's possession (and all of it), and that the information is accurate. In addition, if the City and/or its Consultant becomes aware of an error or omission in the bid opportunity during the bid opportunity process, the City/Consultant must bring that error or omission to the attention of the bidders and correct it by issuing an addendum before the bidders submit their bids.

If the City and/or its Consultant fails to include accurate information and/or to advise the bidders of an error or omission that has come to their attention, the City may not be able to successfully defend a Contractor's claim for breach of contract and/or negligent misrepresentation if the Contractor who has relied on the accuracy of the information presented suffers a loss or damage as a result of the error.

The accuracy of information typically becomes an issue when dealing with the nature of an installation, site conditions, and estimated quantities.

Disclose all Pertinent Information – It is the City's responsibility to include, or ensure its Consultant includes, all information pertinent to the project or the Contractor's ability to carry out the work as disclosed, including the following types of information:

- Original as-built construction drawings including original structure drawings
- Rehabilitation and maintenance drawings
- Recent condition surveys (e.g., bridge deck surface delamination survey, pavement cores, sewer condition survey)
- Recent inspection reports
- Recent materials testing results (e.g., concrete cores)
- Geotechnical test results and/or reports such as soils reports
- Structural evaluation reports
- Infrastructure upgrading alternatives report
- Previous on-going contracts awarded for the project that will overlap with the project in time
- Proposed additional on-going contracts scheduled to be awarded on the project that could overlap with the project in time
- Other on-going activities/work on the project managed by others (e.g., Manitoba Hydro, MTS, , legal surveys)
- Restrictions on access to the site

If the City and/or its Consultant fails to disclose all information in its possession that is pertinent to the project, the City may not be able to successfully defend a Contractor's claim for breach of contract and/or negligent misrepresentation if the Contractor has relied on the information that was presented and suffers a loss or damage as a result of pertinent information in the possession of the City or its Consultant however not disclosed.

Pertinent information disclosure typically becomes an issue for site conditions, inspection/condition reports, and site accessibility.

Provide Clear, Unambiguous, and Consistent Provisions – The City must ensure that the provisions in the bid opportunity are unambiguous and consistent. Special care should be taken to avoid the practices described below, which commonly result in an ambiguous bid opportunity.

The **"copy and paste"** method of bid opportunity preparation involves copying provisions from an existing bid opportunity for a similar project and pasting them into the City's standard form. In theory, this method saves time, however in reality, the problems that may result requires more time to resolve than the time that might have been saved. The risks include:

- Incorrect specifications/cross references. For example, references in the supplemental conditions section to BI:12 that should have been to BI:10.
- Inclusion of language that does not apply at all, is old, or is inappropriate for the current project.

- Inconsistent use of language between sections and use of language that conflicts either within a section or between sections. For example, the GCs may specify that dates for "substantial and total performance" will be specified in the supplemental conditions section of the bid opportunity, however the supplemental conditions section refers instead to "completion dates."

In the **"impossible"** method of bid opportunity preparation, the CA or PM designs engineering or architectural rules without considering the realities of construction. The result is that the bid opportunity specifies things that cannot or should not be done, such as:

- Required equipment that won't fit through the door
- Equipment that cannot be accessed after installation for servicing
- Anchors that are to be installed in inaccessible areas

In the **"incomplete"** method of bid opportunity preparation, the CA or PM fails to specify the work in enough detail to allow the bidder to understand the City's expectations. This problem may appear anywhere in the bid opportunity. Examples are notations such as "see specs" rather than "see Part 3, Clause 3.1, Section 15800, Air Distribution" and "Refer to soils information" rather than "Refer to soils information contained in Appendix A to this bid opportunity." The incomplete method may also result in the Contractor not performing all the work that the City expected. An assumption is that the information has been provided, so its inclusion is not verified and it is left out. The incomplete method may also lead to disputes between the city and the Contractor because they have different expectations of the work that was to be included in the contract.

While the GCs specify how conflicts between the sections of the contract documents (such as bidding procedures, GCs, and SCs) will be resolved, it is of no assistance if the provisions within a section conflict or the provisions between sections are ambiguous. It is therefore imperative that each section of the bid opportunity is carefully reviewed to ensure that the provisions are clear, consistent, and complete.

Include All Bid Evaluation Criteria – The City must include all criteria it intends to use to evaluate bids in the bid opportunity and must use only those criteria in its evaluation of the bids.

The evaluation criteria are in the bidding procedures section of the bid opportunity. Depending on the project-specific requirements, it can include such diverse criteria as:

- Bid price
- Bidder's past performance on projects of a similar nature, size, and complexity
- Bidder's staff resources
- Bidder's equipment resources
- Bidder's identified supervisory and back-up supervisory staff
- Named sub-contractors' past performance on projects of a similar nature, size, and complexity
- Named sub-contractors' staff resources
- Financial responsibility of the bidder
- Adequacy and completeness of information supplied by a bidder in response to an instruction in the bid opportunity

Where price is not the only factor in evaluating the alternatives, other evaluation criteria such as the following are necessary when the bid opportunity requires bids on two or more alternatives:

- "Concrete" vs. "Steel" girder bridge alternative – Criteria for evaluation of life-cycle maintenance costs associated with each of the two girder alternatives
- "Full" vs. "Partial" traffic closure alternative – Criteria for evaluation of public impact costs associated with each of the two closure alternatives

Where the work/project includes purchase of major pieces of equipment or machinery that the bidder may purchase from a number of manufacturers, evaluation criteria such as the following may be included:

- Length and extent of warranty
- Availability of spare parts
- Service and maintenance—quality and response time
- Cost of replacement parts

The consequence of not including criteria the City intends to use to evaluate bids or of using criteria that it has not disclosed to bidders is that the courts may find the City to be in breach of its duty to treat all bidders fairly.

Request only Relevant Information in Bid Opportunity Submission – The City must ensure that bidders are not required to be submitting information with their bid opportunity submissions that the City does not need to evaluate the bids. The bid opportunity template specifies that the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities, if the interests of the City so require.

The bid opportunity specifies that a bidder must complete and return the enclosed bid opportunity submission forms and documents with its bid opportunity submission and the bidder either does not return the specified forms or does not supply the specified documents (or, alternatively, completes the forms in part or supplies some however not all of the specified information), then in consultation with Materials Management a determination, needs to be made if the bid is acceptable or should be determined to be non-responsive.

If an incorrect determination is made, the City may be liable for damages to the bidder, who would have been awarded the Contract had a correct determination been made.

6.4.3.5 How to Specify Insurance

The Corporate Finance, Risk Management Division, Insurance Branch, should be contacted to determine the appropriate coverage and limits. As much lead time and detail as possible should be provided in order to gather the correct requirements. Projects with values over $10 million require the City to provide the insurance. The insurance branch will provide the insurance clauses to be included in the Bid Opportunity and will arrange for the respective policies.

To protect itself against liability and property damage claims, the City must insist on contractual indemnities from both its Contractor (addressed in the GCs) and its Consultant, as well as on insurance protection from both its Contractor (addressed in the GCs and the SCs) and its Consultant.

On certain types of major projects, the City may elect to provide contract wrap-up insurance, with the Contractor providing their own automobile and equipment insurance. However, on most projects, the Contractor is required to provide all insurance coverage in accordance with the contract requirements.

Claims arising out of a construction project generally fall into two broad categories—*liability* and *property damage* claims. Claims that arise or occur prior to the total performance of the work are called *course of construction occurrences,* and those that occur any time after total performance of the work are called *past construction occurrences*.

Construction projects commonly require four types of liability insurance policies:

1. Comprehensive or Commercial General Liability Policies
2. Automobile Liability Policies
3. Architect and Engineer Errors and Omissions (Professional Liability) Policies

4. Wrap-Up Liability Policies

On some occasions due to the known history or condition of a site the insurance branch may also recommend Contractor's Pollution Liability.

Construction projects commonly require three types of property insurance policies:

1. Course of Construction or "all risks builders risk" Course of Construction Policies
2. Contractor's Equipment Insurance Policy
3. Installation Floater Policies (for smaller valued projects)

These types of liability and property insurance policies are described below.

6.4.3.6 Liability Insurance Policies in Construction

Comprehensive or Commercial General Liability Policies ("CGL Policies")

The City requires its Contractors to provide and maintain a Comprehensive or Commercial General Liability (CGL) policy of at least $2 million listing the City as an additional insured and containing a cross-liability and contractual liability clause. For all construction projects, the City will require its Contractor to include products and completed operations endorsement to the policy. Deductibles must be borne by the Contractor and set at amounts acceptable to the City.

In brief, a CGL policy protects the City from third-party claims of bodily injury or property damage that allegedly arise as a result of the Contractor's operations or work on the construction project from persons not associated with the project.

CGL policies do not protect the City from claims of professional negligence (such as errors and omissions) of its consultant/design professionals. In fact, professional negligence is expressly excluded from coverage in CGL policies.

Automobile Liability Policies

The City also requires its Contractor, especially on large bridge, sewer, and road renewal projects and on large building construction projects, to provide and maintain an Automobile Liability Policy for owned and non-owned automobiles of at least $2 million. For these policies, the City is not listed as an additional insured. Deductibles must be borne by the Contractor and set at amounts acceptable to the City.

An Automobile Liability Policy protects the Contractor and therefore the City against a claim from a third party who has been injured by one of the Contractor's cars or trucks while undertaking the construction work. While the City is not an additional insured on the Contractor's policy, the Contractor's insurance can be called upon to back up the contractual indemnity it has given the City and to respond to claims for damage assessed against the City provided we can identify the Contractor and/or vehicle

Errors and Omissions Policies (Professional Liability)

The City should always require its architectural and engineering consultants to provide and maintain an Errors and Omissions (E & O) Policy in an amount that is satisfactory for the particular project. The current Materials Management templates suggest $5 million, however the Insurance Branch should be consulted to determine the appropriate limit for the project. E & O policies protect the City against claims of professional negligence of its Consultant (such as for defects or deficiencies in the drawings or specifications resulting in a failure).These policies should remain in effect either 12 or 24 months after total completion of the project to allow for discovery/recovery under this coverage.

Wrap-Up Policies

Both CGL and E & O coverage can be provided on a wrap-up basis. Depending on the capital cost and/or the complexity of the project the City may provide or can require its Contractor to provide the CGL wrap-up policy and its Consultant to provide the E & O wrap-up policy.

The advantages of wrap-up policies are:

- Overlapping coverage and the problems associated with multiple insurers are eliminated. Overlapping coverage results when the City requires the Contractor/Consultant to provide a single CGL/E & O policy and the Contractor/Consultant requires each of its sub-contractors/sub-consultants to provide a CGL/E & O policy.
- Broader coverage can be provided and higher limits are available.
- When purchased by the City, wrap-up coverage provides greater certainty of coverage as the insurance is for a specific project and the limit of liability has not been eroded by other claims.
- When purchased by the City, wrap-up coverage allows the City greater input into the settlement of a claim.

6.4.3.7 Property Insurance Policies in Construction

All Risks Course of Construction Insurance Policies

Depending on the value of the project or its complexity the City may purchase or require its Contractors to provide and maintain an All Risks Builders' Risk/Course of Construction Policy for all large-building construction projects in the amount of 100 percent of the contract price, listing the City as a named insured. Deductibles are borne by the Contractor and must be acceptable to the City.

While the need may sometimes be less apparent, it is just as important to require an all risks policy for engineering-type work such as water mains, sewers, tunnels, overpasses, bridges, roads, towers, and transmission lines (i.e., structures). In building projects, as well as land drainage projects, it is necessary to ensure that testing and commissioning is included in the policy for 10 days after testing is expected to be completed. This enhancement to the coverage will protect the structure/equipment in the case of failure that results in physical damage.

All risks policies protect an insured against all risks of direct physical loss or damage to an insured's building or structure and equipment unless a peril is expressly excluded by the policy. Risk of loss or damage due to a fire is typically included.

Contractor's Equipment Insurance Policies

The City may require its Contractor to provide and maintain a contractor's equipment policy (including tools) on large projects such as tunnelling, sewer renewals, or other projects involving extensive outlays.

Installation Floater Policies

For smaller projects that do not require a Builder's Risk/Course of Construction Policy a Contractor will be requested to provide an Installation Floater Policy. This coverage will provide the cost of the materials that a Contractor is planning to include in the project while they are en route to the site or while being stored at the work site. It will not pay for damage to a structure as a result of improper installation.

6.4.3.8 How to Specify Bid and Performance Security

The City may require the bidder to provide bid security initially in the form of a bid bond, agreement to bond, letter of credit, bank draft or certified cheque with their bid. The City may also require the Contractor to provide a performance security in the form of a performance bond letter of credit, bank draft or certified cheque, after award of a contract. Administrative Standard FM-002 provides guidelines for amounts of performance security.

Bid Bond, Agreement to Bond and Performance Bond, Letter of Credit

The requirements for bid and performance security and the standard forms are set out in the Bid Opportunity Templates.

6.4.3.9 How to Specify Liquidated Damages

When time is of the essence in a construction contract, it is absolutely imperative that a clause be included in the SCs specifying the dates upon which the Contractor is to achieve both Substantial and Total Performance of the Work. Beyond that, if certain phases of the Work must be completed by particular dates, then those key dates must also be specified in the SCs. In the event that the Contractor does not complete those portions of the Work on the dates specified, then the Contractor will be in breach of the terms of its Contract. The consequence of a breach is that the Contractor will be liable to the City for losses or damages sustained by the City as a result of that breach.

The City has elected to specify in the Contract, a genuine pre-estimate of the losses or damages that it will suffer, by including a liquidated damages clause in the SCs of the Bid Opportunity Template. In the event of a delay breach by the Contractor, the Contractor will be liable to pay the City the sum stipulated in the Contract as liquidated damages for each and every day the work is late, ending on the day immediately preceding the day that the Work has been achieved and is so certified by the CA, unless specified otherwise in the SCs.

As a result, it is a requirement that the SCs contain specific details on specified dates, whether the assessments will be based on calendar or working days, and liquidated damages amounts. It is imperative that the determination of "calendar" or a "working" day basis be made. There are certain types of major contracts where a "calendar day" basis may be more appropriate. For example, the Contract may impose an obligation on the Contractor to work Saturdays, Sundays and holidays in order to facilitate an early opening or re-opening of a facility.

A properly drafted liquidated damages clause will:

1. Explicitly confer a power to extend time in general terms for any breach of contract or prevention by the City and in particular by reasons of Changes in the Work or delay in issuing instructions or information;
2. Define with precision any other circumstances for which an extension of time is to be granted;
3. Make it clear that the power to extend time is exercisable at any time;
4. Empower the City either to deduct liquidated damages from any payment or sum certified under the Contract or to recover them from the Contractor by way of action or arbitration; and
5. Define the per diem amount for liquidated damages.

Determination of Liquidated Damages Amount

Liquidated damages are intended to be a genuine pre-estimate of the City's loss in the case of default by the Contractor, and documentation of its value and the basis of estimate is to be retained in Contract file.

Examples of costs which should be included when determining the amount of liquidated damages for any given contract would be:

- Additional engineering fees and disbursements

- Extra costs for engaging another Contractor to complete the Work, in the event that neither the defaulting Contractor or its Bonding Company is prepared to acknowledge the default
- Utility costs,
- Cost of hiring a security firm to secure the site
- Legal costs.

In the event that a default occurs and the recommended amount of liquidated damages is found to be inadequate, the City would not be able to recover the shortfall from the Contractor. That is, if the SCs specify liquidated damages of $2,000.00 per working day and it actually costs the City $3,000.00 per working day, the City will not be able to recover the extra $1000.00 per working day from the Contractor. However, for a consultant delivered project, the City may be in a position to recover the deficiency from the Consultant.

6.4.3.10 How to Specify Training

Training is an obvious prerequisite to long term operation and maintenance of new works. Training often begins at the design phase, ideally carries through construction, and becomes a prominent activity during commissioning.

The specifications must give an indication as to duration and types of training required. In addition, the knowledge and skill level of the trainees, and that expected of the trainer should be considered in the development of the specification. Often several training sessions must be set up for one system. In a complex system, operators are trained in separate session from mechanical maintenance personnel. Electrical and control maintenance personnel may be trained separately on the same components. Finally programmers, users, and even managers may need training, all at different levels, about different aspects of a product or project.

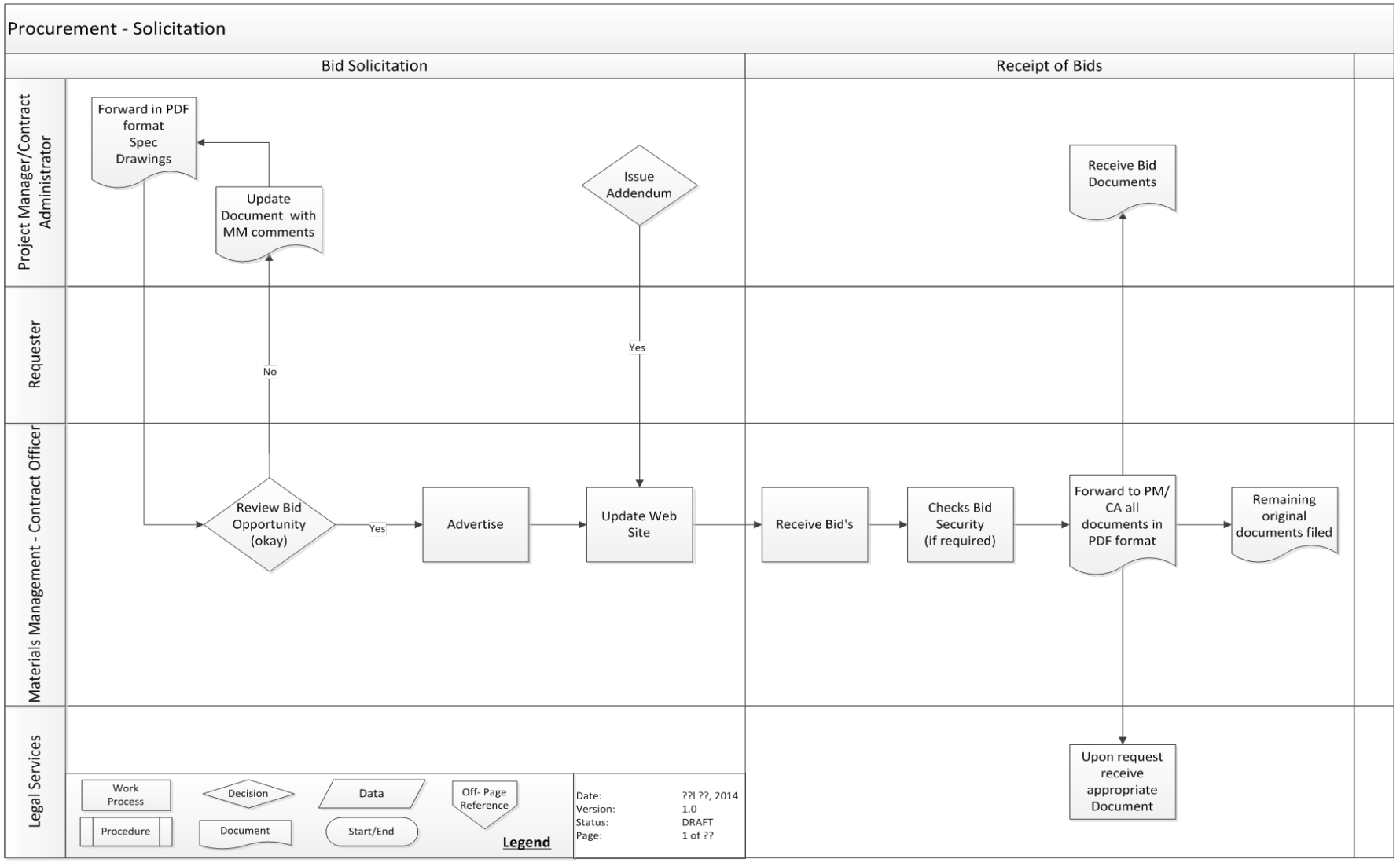
The specifications must indicate what products are to be included in training. Often training manuals, video training tapes, and other O & M manuals should be included in a training specification.

6.4.3.11 How to Solicit and Receive Bids

The City has a structured process through the Materials Management Division for soliciting and receiving bids, which is illustrated in Figure 6-1. The solicitation must not be advertised until all the preliminary requirements have been met. These include:

- All funds associated with the proposed construction work have been approved by Council for the project.
- Any additional funds required to offset a projected contract or project shortfall based on the pre-bid opportunity estimate have been secured.
- All outside agency approvals associated with the contract or project have been secured.
- ** All arrangements concerning land associated with the contract or project have been completed.
- Documentation is on file verifying how the amount specified for liquidated damages was determined.
- The bid opportunity has been thoroughly reviewed by the department and approved by the PM, who then authorizes advertising. Materials Management reviews prior to advertising.

Figure 6-1: Procurement- Solicitation: Bid Solicitation, Receipt of Bids



The solicitation process begins once all of the authority requirements have been fulfilled. The process uses a combination of online services, with Materials Management providing the users with support and assistance after the process has been initiated. The CA initiates the process with a request for a bid opportunity on the City's website at **http://winnipeg.ca/matmgt/templates/bidoopp_num_request.stm.**

After receiving the Bid Opportunity document, Materials Management begins review and processing, including checking the following for conformance with the template:

1. Check bid document for consistency with the advertisement.
   a. Time and date set for final receipt of bids

2. Check bid document for completeness.
   a. Bid opportunity submission forms
   b. Bidding instructions
   c. GCs (to be inserted or referenced)
   d. SCs
   e. Specifications
   f. Drawings

3. Check forms in bid opportunity submission for consistency with text.
   a. Validity period of bids
   b. Amounts of bid security/ performance security where required.
   c. Duration of warranty period
   d. Basis for prices
   e. Basis for schedule of work

The CA contacts Materials Management to arrange a mutually acceptable date for final receipt of bids, considering:

- The worst case scenario for the processing the bid opportunity evaluation and award period, especially if the recommendation for award has to go to Standing Committee or Council.
- The number of bid closings already scheduled in the same timeframe and on any particular day.
- The date for final receipt of bids, which must not be less than 15 calendar days following the advertisement date.
- Any key event (e.g., a site tour) that occurs before the time and date set for final receipt of bids must be made known at this time and must be included in the advertisement.

Bid Opportunity Enquiries

The Contract Administrator must fully document all enquiries received during the bidding period, and the resolution of each. The resolution of each matter brought forward must be one of the following:

1. By satisfactory clarification in accordance with the bid opportunity, in the case of simple misinterpretations.

2. By issuance of a specific addendum clause to provide the necessary clarification, in the case of any inconsistency, omission, discrepancy, change, and/or approval of a substitute.

The Contract Administrator must not disclose any confidential information related to the project, such as the pre-bid opportunity estimate or the project budget.

Addendum Issuance

The Contract Administrator must ensure that each addendum is developed accurately in accordance with the standard City format and practice. The addendum is delivered to Materials Management for issuance to the City's Materials Management website.

Bid Opportunity Opening

Materials Management will oversee the final receipt of bids and conduct the bid opportunity opening in the Materials Management office immediately following the expiration of the time and date set for final receipt of bids. Any bid received after the deadline for final receipt will not be accepted.

The bids received by Materials Management will be recorded on the bid receipt record form. Any bid not containing the required submissions may be rejected. . Materials Management will notify the Contract Administrator of any informalities noted during the bid opening.

The PM and Contract Administrator may attend the bid opportunity opening to observe.

Bid Opportunity Submission Document Disposition

Materials Management forwards a PDF of all bids to the Contract Administrator. The Contact Administrator ensures that all bid information provided by each bidder in the bid opportunity submission documents remains confidential.

After reviewing the bids the CA's recommendation for contract award is sent to the PM for department record and contract preparation purposes. Four sets of the bid opportunity, complete with all addenda, must also be returned to the applicable department for contract preparation purposes.

6.4.3.12 How to Determine whether a Bid is Responsive

A responsive bid is one that conforms to the invitation to bid opportunity in all material respects: that is, there is no non-conformity or irregularity in the bid that would materially affect the contractual relations of the parties or the Contractor's performance the waiver or correction of which would not reasonably be expected to cause prejudice against other bidders.

A non-responsive bid is one that fails to conform to the bid opportunity in a way that materially affects the contractual relations of the parties or the Contractor's performance, or for which the waiver or correction would reasonably be expected to cause prejudice against other bidders.

Details on determining whether a bid is responsive or non-responsive are:

1. The authority having jurisdiction to award must make the determination.
2. The determination depends on the unique characteristics (requirements, evaluation criteria, and so forth) of the particular bid opportunity.
3. A bid may be responsive even though it has one or more irregularities (items that do not conform exactly to the bid opportunity requirements).
4. The correction of clerical errors in bids and revisions made for clarification may be allowed if the irregularities do not render a bid non-responsive (that is, they do not offend the criteria) and the changes are related to technical requirements that the award authority to waive. Examples of irregularities in a bid that would not automatically render the bid non-responsive are:
    a. The bidder fails to affix its corporate seal to its bid opportunity forms. This failure does not materially affect the contractual relations between the City and the bidder because the Corporations Act of

Manitoba provides that an instrument executed on behalf of a corporation by a Director, an Officer, or an Agent of the corporation is not invalid merely because a corporate seal is not affixed. Lack of the seal does not affect the Contractor's performance, and waiver or correction would not reasonably be expected to cause prejudice against other bidders.

b. On a unit price contract, the bidder makes an extension error by multiplying the approximate number of units by their bid/unit price improperly or totals the correctly extended unit prices improperly.

c. The bidder makes corrections or erasures without initialling them.

d. The bidder submits the wrong form of bid bond or agreement to bond.

e. An incorrect warranty period is shown on the agreement to bond (i.e., 1 instead of 2 years).

5. Examples of irregularities in a bid that may render the bid non-responsive are:

   a. The bidder fails to submit bid security with their bid opportunity submission.

   b. The bidder qualifies/conditions their bid; for example:

      - Proposing commencement or completion dates other than those required by the bid opportunity;
      - Failing to submit or complete forms required for evaluation of bids;
      - Making the bid conditional on being awarded the whole contract when the bid opportunity states that the City may award the sections of work separately; or
      - Proposing an alternative to the specified work (e.g., an XYZ pump instead of the ABC pump specified in the invitation to bid opportunity) without obtaining the CA's prior written approval.

The authority having jurisdiction to award the contract has no discretion to award a contract to a bidder submitting a non-responsive bid. The authority must reject the non-responsive bid.

6.4.3.13 How to Determine whether a Bid is Responsible

A responsible bidder is one who meets the following criteria:

- Adequate financial resources;
- Necessary experience, organization, and technical qualifications;
- Satisfactory record of performance on work similar in scope and value, however also has the present capability (staff, equipment) to comply with the specified performance schedule including the contract completion date, considering all existing commitments.

No contract can be awarded to any bidder who, in the judgment of the award authority, is not a responsible bidder or does not have all the necessary experience, capital, organization, and equipment to perform the work in strict accordance with the terms and provisions of the contract.

The authority having jurisdiction to award a contract must determine whether a bidder is responsible prior to the award of a contract. The authority having jurisdiction to award is prohibited from awarding a contract to other than a responsible bidder.

The Bid Opportunity document sets out the requirements for a responsible bidder.

6.4.4 Evaluate Bids and Award Contracts

Bids must be evaluated strictly in accordance with the criteria specified in the bid opportunity. If the City either does not evaluate the bids received strictly in accordance with the specified criteria or uses other than the

specified criteria to evaluate the bids received, the unsuccessful bidder(s) may bring an action for damages against the City that the City cannot successfully defend.

6.4.4.1 How to Evaluate Bids and Recommend Award

The Materials Management Division forwards a PDF of the original bid submissions to the CA, whether the CA is a City employee or a Consultant.

The procedure for the CA's detailed bid evaluation is:

- **Determination of the Responsiveness of the Bids –** Based on a thorough evaluation of the bid submissions received from each bidder, the CA independently assesses whether the informalities are material (so the bid is non-responsive) or technical (only the Award Authority has authority to waive informalities related to technical details). The CA must provide reasons for determining the bid to be responsive or non-responsive, (in consultation with Materials Management or Legal Services).
- **Evaluation of the Prices (Form B: Prices—Unit Prices) –** The CA must first extend all unit prices to verify the total price bid for each item of work, and for the total bid price for each bidder. These results are summarized in a "tabulation of bids" in the standard City format, showing and describing all informalities. The final tabulation of bids shall be sent back to Materials Management for posting to the website.
- **Evaluation of the Prices (Form B: Prices—Lump Sum) –** The CA must confirm that each bidder has entered a total bid price on Form B: Prices—Lump Sum.
- **Evaluation of all Other Bid Submission Forms and Documents Required to Be Submitted by the Bidder –** The CA must examine all other forms and documents submitted by each bidder, identify all informalities found in the forms and documents, and summarize the results in a "summary of bids" on the standard City format, showing and describing all informalities (e.g., what areas are incomplete).
- **Unsolicited Information –** The CA must not review or consider any unsolicited information or documentation that may appear during the bid evaluation period. The CA also must not contact any bidder or otherwise request additional information or clarification from any bidder without the prior approval of the Materials Management or Legal Services.

Bid Mistakes

The law provides that the City cannot accept a bid submission from a bidder if a mistake is apparent on the face of the bid unless the bidder consents to waive the mistake.

Mistakes apparent on the face of a bid submission for a lump sum contract typically are in one of these two categories:

1. The bid price of the lowest bidder is substantially lower than the pre-bid opportunity estimate. This assumes the other bids received are close to the estimate; if *all* of the bid prices received are substantially higher or lower than the estimate, the estimate does not help in assessing a bidder's request to withdraw on the grounds that its submission contains a mistake.
2. The bid price of the lowest bidder is substantially lower than all the other of the bids received.

Mistakes apparent on the face of a bid submission for a unit price contract are generally easier to detect than on a lump sum contract. They include:

1. The bidder has failed to include a price for a work item on Form B: Prices—Unit Prices.

2. The bid prices of the lowest bidder for one or more items of work on Form B, Prices—Unit Prices or for the work as a whole are substantially lower than the pre-bid opportunity estimate(s).
3. The bid price of the lowest bidder for any one or more of the work items on Form B: Prices—Unit Prices or for the work as a whole is substantially lower than the bid prices received from all other bidders.

Procedure to Follow When Bidder Advises of Bid Mistake

A bidder seeking to withdraw a bid on the grounds that it contains a bid mistake usually does so within hours of bid opportunity closing. If the City receives an oral communication (i.e., telephone call) from a bidder advising of its bid mistake, the bidder should be instructed to put the information in writing, including details of the mistake and how it was made and the request to withdraw, and to send it to Manager of Materials,. The CA or other City staff should make no comments to the bidder. The entire project team should also be instructed to refer any similar oral communications without comment directly to the Manager of Materials.

The Manager of Materials in consultation with Legal Services determines whether the mistake is a bid mistake apparent on the face of the bid.

If the Manager of Materials and Legal Services concur that the bidder has made a mistake that is apparent on the face of its bid submission, the Manager of Materials should prepare a letter to the bidder permitting the bidder to withdraw the bid without penalty.

If the Manager of Materials and Legal Services Department concur that there is no mistake apparent on the face of the bidder's bid submission, the CA on behalf of the department should immediately write an award report recommending that the contract be awarded to the bidder, notwithstanding its request to withdraw, and should forward the recommendation to the Award Authority for approval. The award report must advise the Award Authority that the bidder has made a request to withdraw its bid due to an alleged mistake; it must provide the Award Authority with all details and reasons the bidder gave to the City for the mistake and it must detail why the Manager of Materials in consultation with Legal Services has concluded that there is no mistake apparent on the face of the bid submission and why it has recommended that the Award Authority reject the bidder's request to withdraw without forfeiting its bid security.

Immediately following a decision of the Award Authority not to allow the bidder to withdraw the bid without forfeiting the bid security and in no event later than the time period specified in the bid opportunity form, the Department Head must issue a Letter of Intent (LOI) to the bidder advising that the bidder has been awarded the contract. If the Letter of Intent is not issued within the specified time period, the bidder's bid, together with any entitlement the City may have to its bid security, will lapse.

On receipt of the Letter of Intent, the Legal Services prepares the contract documents and forwards them to the bidder for execution and return. The bidder advises the City upon receipt of either the Letter of Intent or the contract documents that it will undertake the work for the price bid or that it will not undertake the work, notwithstanding the Award Authorities decision. If the latter, the Department must notify the Legal Services, which will make demand on the bidder's surety company if its bid security was a bid bond, or on the bidder's financial institution if its bid security was a letter of credit.

Following a demand on the bidder's Surety Company or financial Institution and on the advice of the Legal Services, the Department then instructs the authority with jurisdiction to award the contract to issue a letter of intent to the bidder submitting the second-lowest evaluated responsive bid.

Withdrawal of Bids prior to the Award of Contract

Bidders are only entitled to withdraw their bids without forfeiting their bid securities at any time prior to the time and date set for final receipt of bids specified in the bid opportunity. Bidders are not entitled to withdraw their bids without forfeiting their bid securities after the time and date for final receipt of bids. Bidders who

withdraw their bid after the time and date set for final receipt of bids however before an award of contract forfeit their bid securities, unless Manager of Materials or Award Authority, in consultation with Legal Services, allows otherwise.

Contract Administrator's Recommendation of Award

After completing evaluation of bids, the CA meets with the PM to review the findings summarized in the "Summary of Bids" and "Tabulation of Bids" forms to:

(1) Discuss any informalities found in the bids,

(2) Determine whether the CA's assessment that a bid is either responsive or non-responsive can be supported by the reasons the CA has given (the department may have to follow up and obtain the opinion of the Legal Services Department before confirming),

(3) Discuss the qualifications of the lowest-evaluated responsive bidder and their sub-contractors to perform the work, and (upon resolution of all uncertainties) tentatively schedule an early date for the pre-award meeting.

Pre-Award Meeting with Lowest Evaluated Responsive Bidder

The pre-award meeting should generally involve only the three principal participants: the lowest evaluated responsive bidder, the CA, and the PM. The CA may also request that certain or all of the designated sub-contractors listed in the bid submission be available for discussions involving their capabilities and commitment to their aspects of the work.

The CA should chair the pre-award meeting, opening with the standard disclaimer that "it is not the intent of this meeting to award the contract or make any changes however only to confirm the intent and ability of the Contractor to undertake and perform the work in accordance with the bid opportunity documents and the bid."

The CA should then review the scope and schedule of the work to ensure that the bidder has no misunderstanding about the extent of the work and to confirm that they have no reason to believe that they cannot perform the contract in accordance with the bid opportunity documents. , the CA should advise the Contractor that they have an obligation to enter into contracts with the sub-contractors that require them to perform their work in complete conformance with and subject to the terms and conditions of the Contractor's contract with the City. Further, the CA should discuss any site investigations carried out by the bidder to ensure that the bidder's findings were consistent with the site information disclosed in the bid opportunity.

The CA keeps proper detailed minutes of the pre-award meeting, and promptly transmits a copy of them to all parties for confirmation of accuracy in the recording.

Contract Administrator's Final Recommendation of Award

The CA prepares and transmits to the department an unequivocal recommendation for award, supported by reasons. The letter of recommendation must be accompanied by the "Summary of Bids" and "Tabulation of Bids" forms, and the bid opportunity submissions of all bidders.

A recommendation to reject any bid(s) as non-responsive, and/or a recommendation to award to other than the lowest evaluated responsive bidder, must be fully explained to the satisfaction of the department.

6.4.4.2 How to Award Contracts

The department reviews the final recommendation of award from the CA and promptly resolves any identified inconsistencies that could impede concurrence or implementation of the contract award. If the department

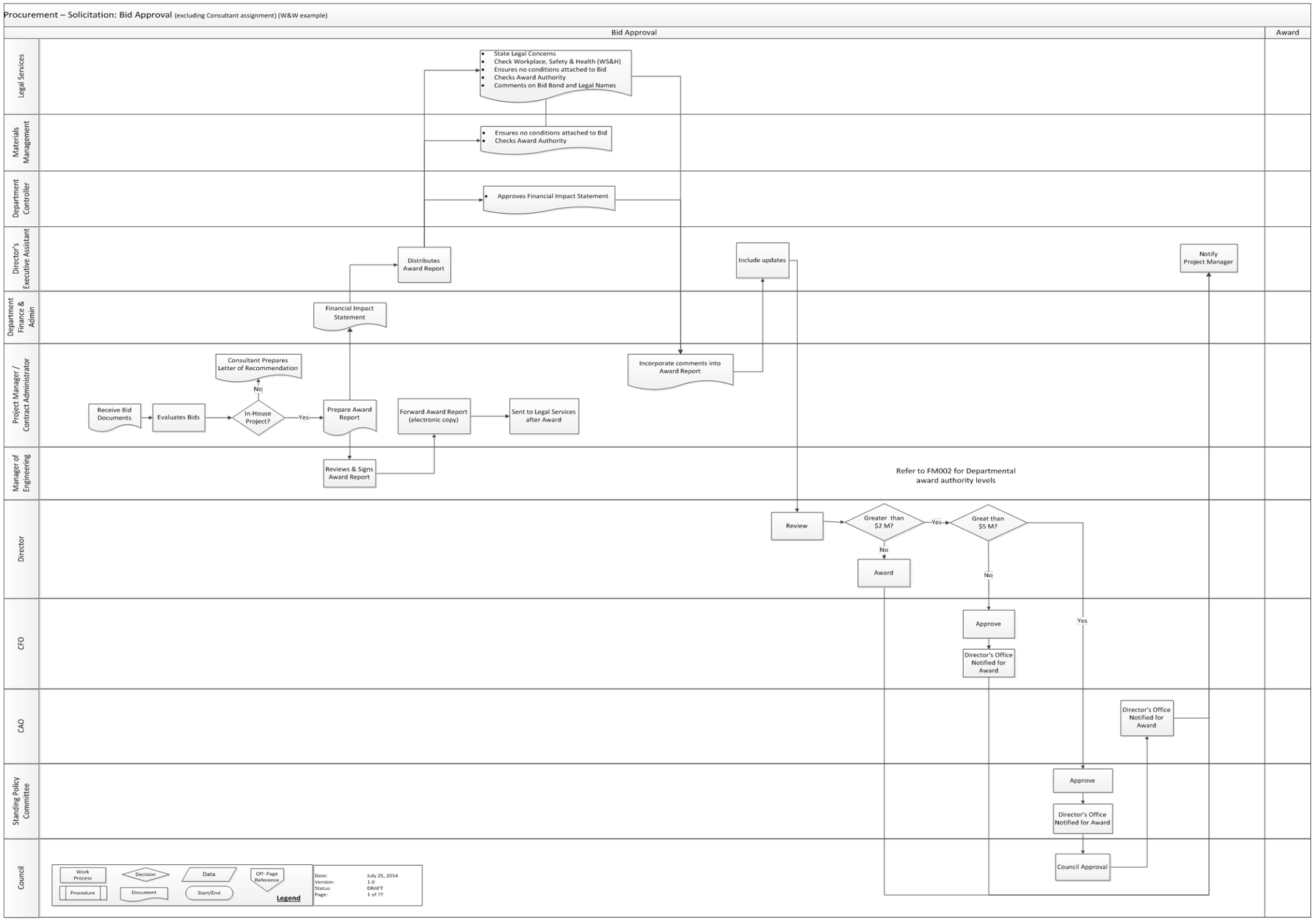
and CA recommendations differ, the difference must be resolved in consultation with Materials Management and Legal Services prior to the department's award report.

The City has a structured process for approval of award and final award. A process chart for the bid opportunity submission approval process is shown as Figure 6-2.

6.4.4.3 Award of Contract Template

A template for the award report can be found on the City's website at http://citynet/cao/administrative_directives.

Figure 6-2: Procurement – Solicitation: Bid Approval.



The PM must prepare an award report in accordance with the current standard format, including a one-page executive summary if the report exceeds three pages.

Award reports on major/complex projects and/or award reports that must address bidding irregularities, construction alternatives, budget complications or overruns, or the exercise of an option to add/delete alternative or separate price items must be expanded to fully explain and justify the proposed course of action. An expanded discussion section is required related to the following award complexities:

1. Additional funding requirement
   a. Applies to either the contract or other parts of the project.
   b. If not available from surplus funding in the department, must be sought from other funding sources.
2. Outside agency approvals
   a. All approvals required for the project to proceed must be secured.
   b. Explanation of each approval must be provided.
   c. Property acquisition or easement agreement for the project to proceed must be in place.
3. Construction alternatives
   d. Explanation of the alternative.
   a. Reason for recommending the one chosen.
4. Public (traffic) disruption
   a. Identify impact based on project schedule/alternatives.
5. Accelerated completion bonus
   a. Cost/benefit statement to justify recommendation.

Legal Services, Materials Management, and Controller Approvals

The award report must be approved by Legal Services, and Materials Management and the department controller before being forwarded for approval and award at the designated level.

> **Legal Services –** Legal Services reviews the award report and may either approve it (with or without comments) or not approve it, stating the legal concerns and/or ramifications associated with proceeding with the award.
>
> **Materials Management –** Materials Management reviews the award report and may either approve it (with or without comments) or not approve it, stating the reason(s) for withholding the approval.
>
> **Controller –** The controller reviews the award report and may either approve or not approve it, on the basis of verification of the availability of sufficient authorized funding for the designated project work.

Legal Services and Materials Management review the award report to ensure that:

1. The recommendation for award is to the bidder submitting the lowest evaluated responsive bid (or most advantageous offer in the case of an RFP).
2. The department has correctly determined that the bidder recommended for the contract award is indeed the bidder submitting the lowest evaluated responsive bid.
3. Known informalities or irregularities in the recommended bidder's bid opportunity submission have been identified and that a correct determination has been made about their materiality.
4. The department and its Consultant have determined that the recommended bidder is responsible (qualified to do the work).

5. The department has confirmed that there are sufficient monies available in the budget (or to be transferred in) to pay for the work once the contract is awarded.

Approval of the Award Report from Legal Services and Materials Management does not mean that the department has evaluated the bid submissions correctly unless the department has consulted with Legal Services or Materials Management during the evaluation process.

Award Process

The Award Report must be routed to the appropriate approvers and award authority. In some cases, however not all, approval and award are by the same authority. Council and its committees may approve of an award of contract to be made by the CAO. The CAO has delegated the issuance of all letters of intent awarding the contract to the Department Head).

The award authority for a contract depends on its type and value, and on availability of budget funds. A complete explanation of the process is provided in Administrative Standard FM-002 located on the City website, at http://citynet/cao/administrative_directives/financial_management/default.stm .

6.4.4.4 How to Form a Contract

After all the approvals have been made, a contract must be formed. There are three options for this identified in one or more of the RFP and bid opportunity templates and GCs:

- A Letter of Intent (LOI) is issued by the award authority with a requirement to execute a formal contract within a specified time period. The contract is prepared by Legal Services.
- A purchase order (PO) is issued in lieu of the execution of a contract.

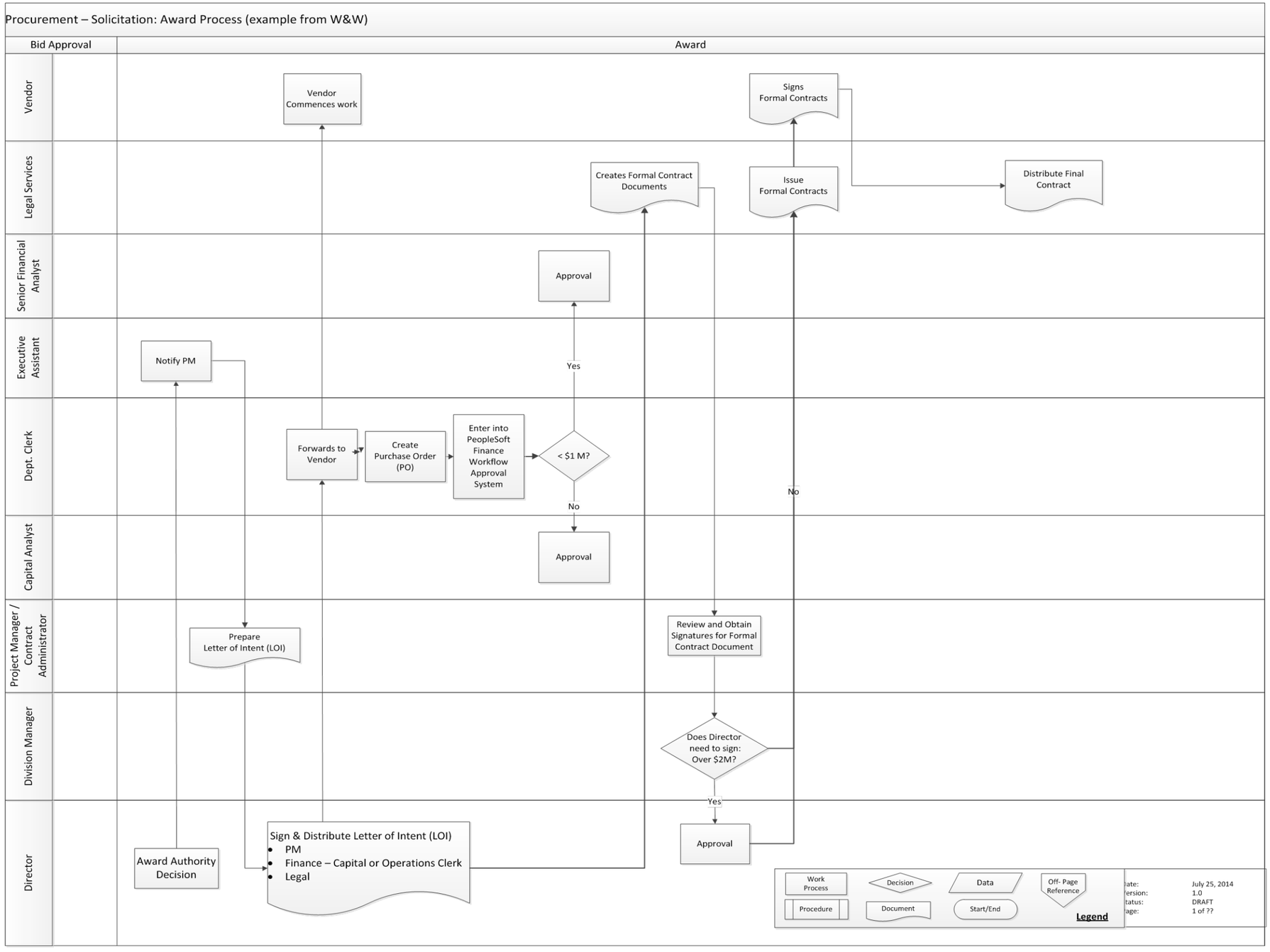
A Letter of Intent is issued by the award authority in lieu of the execution of a contract, with the bid documents in their entirety deemed to be incorporated into, and form part of, the contract. There is a specialized form of Letter of Intent for Consultants located on the City website, at http://www.winnipeg.ca/matmgt/templates/contract_administration/Contract_Administration_Letters.stm.

The process is illustrated in the process chart included as Figure 6-3

The contract must be signed by an approved signing authority. The award authority and signing authority are not the same.
Templates for the Letters of Intent and Regrets Letters for the unsuccessful bidders are available from this page on the City's website: http://www.winnipeg.ca/matmgt/templates/contract_administration/Contract_Administration_Letters.stm.

Standard consulting agreements are available from this page on the City's website: http://www.winnipeg.ca/matmgt/templates/consultants/Consultant_Information_Page.stm.

Figure 6-3: Procurement – Solicitation: Award



6.5 Direct and Manage Work

The work activities are directed and managed in order to achieve the project's objectives. Directing and managing may include one or more of the following:

- Managing project activities
- Administering contracts, which may include those for consultants, construction or third parties
- Directing and managing in-house delivery

Directing and managing work involves a variety of activities, such as managing the team, directing project communications, reviewing project deliverables, making decisions, and generating and providing project data.

Contract administration for Consultants, Construction Contractors, and third-party Contractors is similar. Each is a type of vendor that has a contract with the City, and contract administration for any of the three involves managing the work provided in accordance with the terms and conditions of the contract. The contracts with the three types can be different, which creates differences in the City's role, relationship with the vendor, and administration activities, however the applicable project management and contract administration processes are the same.

Directing and managing differs from monitoring and controlling, which involves managing changes and taking corrective action, as described in Section 7.

6.5.1 Manage the Project Delivery Plan

The project management work is defined in the PDP is based on an overarching plan for project management and delivery, encompassing the entire project delivery chain to be managed by the PM.

The PM is responsible for acquiring a project team and directing their work assignments, including scope of services, level of effort, and expectations. The PM confirms that the services are being provided and delivered as required to meet the objectives of the business plan. For projects involving in-use facilities, it can be particularly challenging to maintain normal operations during construction. The PM must coordinate either directly, by communicating with operations staff, or indirectly, by facilitating and monitoring other set procedures. The coordination requirements may include:

- Maintaining operation of the existing facility during construction
- Maintaining proper lines of communication
- Planning and preparing for operation of the new work well in advance of actual transfer

City representatives for site work may be assigned to assist or take a lead role to support the PM. Under either working relationship, the PM must retain responsibility for quality and project delivery. Communication and coordination responsibilities are vulnerable to breakdown under these situations, particularly when the Contractor's work encroaches on the operating staff's daily responsibilities. Even though authority may be assigned to the Consultant to act on the City's behalf for these services, the PM must monitor site communications for conformance with protocols and formal lines of communication as identified in the PDP and the contracts.

Projects may have third-party commitments, such as utility coordination. The PM must see that the required coordination is carried out, either directly, by communicating with others, or indirectly, by facilitating and monitoring other set procedures.

The PM is responsible for the entire project budget throughout the full project delivery chain. This may include cost items in addition to the product itself, such as application fees, utility coordination, and

engagement of third-party services. The PM reviews progress and billings and coordinates with Accounts Payable for payment. The PM is responsible for taking corrective action if the costs or projections do not conform to the PDP and project budgets, as described in Section 7.

The PM is responsible for coordinating events within the PDP schedule. The PDP schedule for the full project delivery chain is likely to commence earlier and extend well beyond those for Consultant or Contractor services. The PM reviews schedules and confirms that critical dates and milestones are being met and are achievable.

Project-level communication is required as identified in the PDP. The PM is responsible for arranging and undertaking the communications, which may include communications with the following individuals:

- Project Sponsor, to provide updates or request advice or input
- Major Capital Project Steering Committee, to address risks and major project issues
- Project Advisory Steering Committee, for updates and decisions
- Business Owners and operations personnel, to receive input or provide information on operating issues or impacts
- Other business units or departments, for coordination
- Manager of Capital Projects, for project updates and issues

6.5.2 Manage DBB Projects

For consultant delivered DBB delivered projects, the CA (Note: per section 5.6 the role is designated as “contract project manager”) must administer the Consultant’s contract. Maintaining focus on the unique product, service, or result is of paramount importance, since the project is undertaken to achieve a benefit as defined in the business case. The most effective way for the City and Consultant project team(s) to meet this goal is to work collaboratively. The PM and project teams accomplish this through a teamwork approach, not only by administering however by facilitating and supporting the Consultant in developing deliverables and providing timely reviews and approvals.

The CA is responsible for administering services in accordance with the Consultant contract, which is drawn from the RFP, GCs, proposal and the Consultant PXP. The Consultant will be required to prepare PXP consistent with the requirement of the City’s PDP. The services include a variety of coordination, facilitation, and decision-making relating to scope, schedule, and deliverables and making payments for the services. The City PM will have specific deliverables and task assignments based on the approved PDP and must manage and facilitate City interactions and participation.

The consultant service contracts may vary with a wide range in the deliverables. For the DBB project the Consultant will normally be responsible for the means and methods of the assignment and the City PM will be responsible for contract administration of the Consultant contract regardless of the details. The City PM is responsible for approval and monitoring of the Consultant PXP.

The Consultant will develop their PXP based on the requirements in the contract, the PMM and their own internal project management and product delivery processes. If any conflicts exist in best practises the City will provide the Consultant formal direction via the change control process. The goal is for Consultants to follow the PMM processes and conform with the PDP in meeting the project goals, and ensure consistency and best practise in how projects are managed and delivered. This will not interfere or limit the Consultant from implementing new concepts or designs in the product or service being delivered.

The Consultant PXP will include a team chartering process. Project management best practices identify project team chartering as a key enabler for project success in developing a project team. The preferred

approach is for the Consultant chartering session to include the City's PM, at a minimum, and preferably the entire City project team, operations, and Senior Management staff, including the Project Sponsor.

The main work to manage and direct the project is defined in the consultant contract and as detailed in their PXP. Contract administration is carried out by the CA (CA is role based – the PM may also fill the CA role) for all types of project. The CA responsibilities generally include the following:

- **The Deliverables to be provided -**when and for how much money
- **Information Transfer –** Providing information is a City deliverable for the consulting contract and it is a critical task that must be carried out in a timely manner, since the Consultant's ability to perform work depends on it. The PM and project team collect, or coordinate collection of, all internal data and information and confirm that the information has been transferred.
- **Decisions –** The City is responsible for timely review and a prompt response for decisions to Consultant submissions and requests. Response times for City review periods should conform to those identified in the PXP or contracts and are to be managed by the PM.
- **Communications –** Communications are carried out according to the contract or as further agreed on. For larger projects, regularly scheduled meetings should be held between the PM and Consultant representative, along with regular or milestone project update meetings with the City's project management team and Project Advisory Committee.
- **Schedule –** The Consultant's work schedule included in the contract should be used for coordinating and scheduling work. The Consultant and PM regularly update progress against the baseline. The original schedule must not be changed even if target dates will not be met, unless authorized through a change process as part of the project controls, as discussed in Section 8. The PM is responsible for providing any City input to the schedule within the timeframes identified.
- **Quality Management –** For major projects, Consultants should have an internal QA/QC process. While the process should be developed, owned, and administered by the Consultant, familiarity with the program and its use will give the PM an additional QA measure to use. An effective Consultant QA/QC program may warrant reduction of the level of risk assigned under the risk assessment.
- **Cost Estimating –** Cost estimates for a product are required as part of most consultant assignments. While there are well-defined techniques for developing estimates, the process can be challenging on certain types of projects. The contract should identify the estimating technique to be used and the estimate classification system, which the PM can then monitor under the QA process.
- **Payments –** Standard consultant contracts provide for monthly billing, with the billing method and conditions defined in the consultant contract. The process for approving payments is:
  - The Consultant submits a monthly invoice based on the deliverables status and progress
  - The CA reviews the invoice and notifies the Consultant of any errors or omissions
  - The PM verifies the progress and authorizes payment for consultant services

The CA is responsible for measurement and payment. Work progress is measured through the monitoring and control processes and is usually straightforward, as it is readily measured and confirmed through submission of deliverables. It may be more complex at interim levels of completion where level of progress must be estimated. Regular communications between the CA and the Consultant should provide sufficient validation of progress and support for approval of payments.

6.5.2.1 How to Manage Consultants

Consultants are an important part of the City's project delivery chain. They typically have a close working relationship with the PM and project team and play a major role in shaping or influencing the project direction.

Consultants work under contract with the City and the PM/CA must, without exception, administer their services according to the terms and conditions of the contract. This means that if the Consultant is expected to manage a project in a certain way, it must be stipulated in the RFP, incorporated in the contract and detailed in their PXP.

In most cases, the Consultant has expertise in project management as well as in providing technical services. Prescribing Consultants' work methods and procedures should be balanced and consistent with the contract, considering both the extent of the need and the potential increase in costs and benefits.

6.5.3 Manage Design-Bid-Build Construction Contract

DBB contracts are the most common method of delivery for construction projects and are used for consultant and in-house delivery. They also have unique contractual arrangements for the construction contract.

For consultant delivered DBB contracts the Consultant usually provides resident and non-resident contract administration services with authority for CA granted to the Consultant by the City under the GCs and SCs. The GCs define the CA as "the City's representative throughout the duration of the contract" and state that the administrator "shall have authority to act on behalf of the City to the extent expressly provided for in the contract." The person or firm filling the role is identified in the SCs of the bid opportunity.

This situation can cause confusion at the project team level between the City and people in consulting roles. The City representative role in the construction contracts is "City Representative" – see Section 5.6). To effectively perform the CA services, the delivery team must understand their roles, responsibilities and authority and the Consultant must have the autonomy and support needed.

The Consultant CA is responsible for:

- Administering the construction contract(s)
- Communicating with the Contractor
- Providing project direction
- Administering contract deliverables
- QA and QC inspections
- Measuring (verifying) for payment for the construction contract

While carrying out these services, the Consultant coordinates with the City (City Representative) on:

- Advice to the City
- Review of alternatives
- Status updates and reports
- Regular communication

For DBB, Consultant deliverables are in the form of both products and services. Since the Consultant is the CA, the deliverables are construction information, including schedule, quality, and adherence to budgets, as well as information needed for transferring the completed project.

The PM is responsible for administration of the consulting contract and, therefore, indirectly, for the construction contract. Accordingly, the PM must monitor the Consultant's services, referring to consultant-provided information in construction status reports and forecasts.

Standard construction contracts provide information on monthly progress payments. As CA, the Consultant is responsible for measuring or verifying that the amount billed matches the actual completed work. The Consultant then recommends that the City pay the Contractor. Monitoring and managing changes for construction projects is discussed in Section 7.

The Consultant may be responsible for the actual commissioning or for coordination of commissioning, or a separate contract may be used for commissioning. The PM must provide coordination and process oversight in either the case.

6.5.3.1 How to Perform Contract Administration

A Contract Administration manual is provided in Appendix E. The manual description of best practices for administration of construction contracts throughout their duration and during the warranty period.

Change Control on contract is provided in Section 7. Construction contracts are part of the delivery chain, they need to be monitored and controlled and must be included in the integrated change control process.

6.5.3.2 Contract Administration Manual

A Contract Administration manual is provided in Appendix E.

6.5.3.3 Contract Administration Templates

Appendix B references a number of Contract Administration templates.

6.5.4 Manage In-House Projects

The project management processes for in-house delivery are the same as for consultant projects, using the planning processes and outputs described in the PMM Section 5. The main difference is that City staff take on the technical role and produce services, results, or product deliverables such as conceptual designs, detailed designs, and drawings and specifications for construction projects.

The organizational structure includes internal City staff for this method of delivery. As for consultant projects, study managers, design managers, task leads, and discipline staff may be needed.

6.5.5 Design Management (Future)

6.5.5.1 How to Manage Design (Future)

Refer to Appendix E for procedure on Design Management Quality procedure.

6.6 Manage Quality

6.6.1 Perform Quality Control

QC involves preparing and following the plans identified in the PDP or PXP and carrying out the QC methods and techniques defined in the quality management plan. Quality is a shared responsibility, and each team member must:

- Be aware of their shared responsibility for quality.
- Follow quality and design standards as defined.
- Carry out draft reports and interim reviews as scheduled.
- Complete calculation and design checks.
- Use checklists and validate information.

For quality related to the PDP, the PM is assigned the role of quality manager. The quality manager is responsible for development of quality plans, dissemination of quality procedures to the team, and confirmation of compliance with the procedures. The quality manager is not necessarily responsible for carrying out all of the quality checks, as quality is a shared responsibility.

6.6.2 Perform Quality Assurance

QA is performed in accordance with the PDP quality plan. QA includes those tasks specifically listed in the QMP and the following:

- Assess the QC result to determine what processes and procedures need to revised to ensure the customer requirements are meet.
- Review outputs and deliverables at defined stages.
- Timely reporting of results.
- Review and updating the processes, procedure and QC standards.

QA is an inherent requirement of the PM. The expectation is for the PM will develop the PDP according the PMM. The PM will plan, arrange, monitor, and administer the project to the PDP that meets the project goals and objectives. QA from this perspective is carried out through review or auditing and, for PDP related activities, includes:

- Review and monitor progress for the entire project for completeness and ability to meet the defined goals and objectives.
- Review and monitor progress for the entire project for impact on operations and ability to meet the defined goals and objectives.
- Review and monitor Project performance measurers.

The quality plan identifies specific review and audit requirements. The PM and project team provide formal QA during the project phases through direct reviews of the reports and designs submitted by Consultants. This includes review of draft documents and staged and final design reviews.

The PM must manage problems identified from the quality reviews. Remedies for deficiencies are addressed in the monitoring and control processes discussed in Section 7.

6.7 Manage Communications

Managing communications is the process of distributing information, carrying out stakeholder communications, and managing stakeholder expectations. The execution follows the detailed communications plan listed in the PDP.

6.7.1 Distribute Information

The “distribute information” process involves carrying out the communications defined in the PDP communications plan. New data are produced continually during project execution and the data and information must be reported and distributed as identified in the plan.

6.7.1.1 How to Manage Consultant Communications

Consultants sell knowledge and confidence, with their primary resource being human talent. Fully 70 percent of a Consultant’s operational cost is made up of salaries and benefits. The critical operational element in any project is therefore to ensure effective use of the Consultant’s human resources. This is naturally a management role, with the success of the service being a direct function of the PM’s involvement. The ability to effectively communicate with the Consultant is therefore a vital element of project success.

Effective communication is not only key to project success, it is also the principal way to avoid unnecessary disagreement, and the potential for costly and protracted legal actions that frequently stem from misunderstanding, misinformation, or no information at all. When dealing with the Consultant, whether “speaking or sending,” it is important to be clear about the message and to know its purpose, which could be to:

1. Give project-related information and objective data.
2. Reveal concerns, opinions, feelings, or subjective data.
3. Initiate action (for example, requests, requirements, commitments, or changes).

The PM and the Consultant should understand that effectiveness decreases considerably as communication moves from face-to-face (direct) to telephone, and again from telephone to written. However, each form has its place in continuing coordination, and each must be used appropriately. Generally, these guidelines apply:

- Direct communication during meetings or consultations is useful to address issues, problems, or complex matters; gather ideas interactively; and initiate important actions or decisions.
- Telephone conversations (or conferences) are useful to solicit information, provide sensitive information, or serve as an urgent substitute for direct communication.
- Written communications, such as memorandums, letters, or reports, are useful to transmit factual information, request formatted information, or provide updates or routine changes confirming discussions and interpretations.

While speaking directly to the Consultant is the most effective means of communication, in a court of law, unwritten evidence may be considered hearsay, and is always considered less reliable than written records. Therefore, maintaining clear and concise business records for every project must be standard operating procedure for every PM. Moreover, these procedures must be designed to build chronological records of a service undertaking from its inception to its conclusion.

While most documentation is the Consultant’s responsibility, it is advantageous for the PM to maintain records that clearly identify all decisions, instructions, changes, progress check points, inspection results, and other activities affecting the outcome of the work effort.

The following written records should be maintained for all projects:

- Memoranda of all conferences (i.e. minutes of meeting)
- Names and addresses of all parties concerned with the project
- List of all data furnished to the Consultant
- Copies of all communications to and from the Consultant, to include memoranda of all telephone communication
- Memoranda listing all work products submitted from the Consultant, with date of submittal and date of acceptance and/or approval by the PM
- Proposed and actual completion dates for each service activity or phase of service production
- Date of submission and approval of drawings and other data required by governmental review and regulatory agencies
- Final construction estimate
- Amounts of all bids and sub-bids
- Date of issuance and return of all documents by Contractors
- Date of approval or acceptance and copies of surety bonds, certificates of insurance, progress schedules, tests, and schedules of values
- Dates and results of shop drawing and sample review
- Copies of certificates for payment and change orders
- Reports from project inspectors and field representatives
- Dates of approval or rejection of work or materials
- Copies of certificate of completion, certificate of total performance, and certificate of acceptance
- Final construction costs
- Summary of all project service expenses
- Photographs taken before, during, and after construction

Meetings can be productive ways to provide and receive continuing updates of project status. The PM's and Consultant's time is valuable, so the following guidelines are used to help make meetings brief and effective:

- Call meetings only when they facilitate problem-solving, or when direct communication or resolution is required.
- Explain the purpose of the meeting and have an agenda.
- Identify each item as meant to (1) provide information, (2) promote discussion, or (3) initiate action.
- Set time estimates or targets for each item on the agenda, as well as for the entire meeting; keep presentations and discussions moving along.
- Agreements, conclusions, and responsibilities resulting from the meeting must be summarized, usually after each point (if practical to do so) and also preferably in writing at the end of the meeting, by means of memoranda to file, telephone memoranda, job memoranda, or field memoranda.

6.7.2 Manage Stakeholder Expectations

Managing stakeholder expectations involves planned and unplanned communications with stakeholders to minimize their concerns and influence their expectations. The objective is to increase the likelihood of project success; goals are to resolve issues, build trust, increase buy-in, and overcome resistance to change.

Sensitive unplanned communications may be needed. Undertaken directly by the PM or coordinated through the PM, these include communication with:

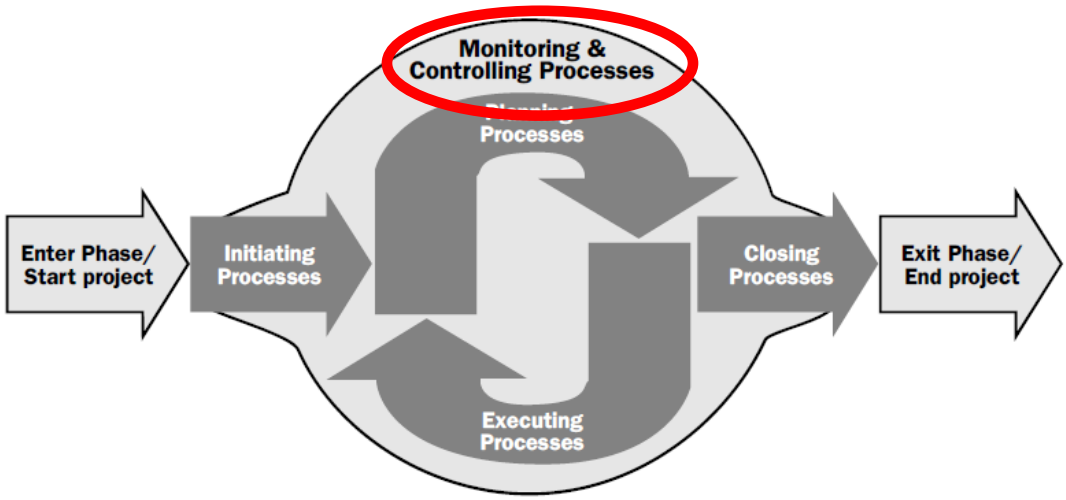
- Regulatory or permitting authorities
- Stakeholders, for education, information, and input
- The public, for general communications
- The media

- Any special protocols as identified in the communications plan for this type of communication must be followed.

7 Monitoring and Controlling Process Group

Monitoring and controlling is the fourth of the five project management process groups. The monitoring and controlling process group consists of tracking, reviewing, and regulating the project through all phases, including project management and product delivery tasks for all four project objectives (scope, costs, schedule, and quality). Monitoring and controlling processes are closely related to and often overlap with the "direct and manage" processes of Section 6. Monitoring includes measuring, collecting, reporting, and distributing performance information. Controlling includes determining preventive or corrective actions and following up on action plans to determine whether the actions taken resolved the performance issue.

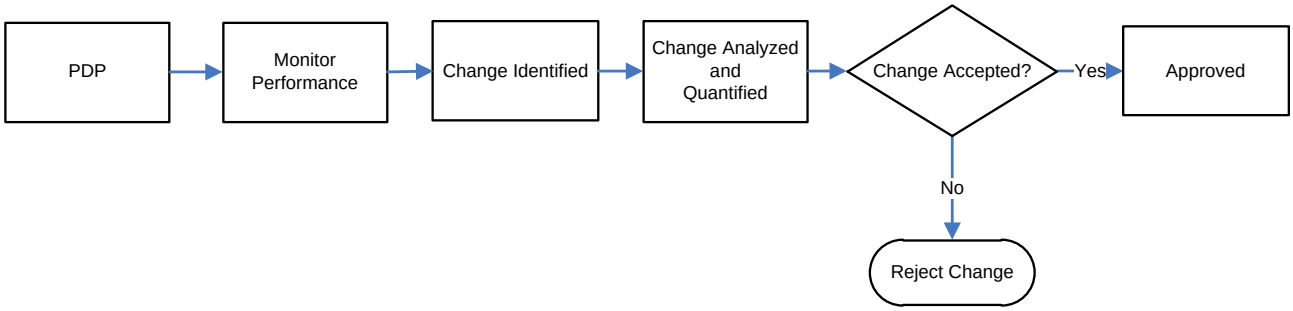
To be effective, monitoring and controlling must be carried out in relation to a baseline, which will have been produced from the planning processes and documented in the PDP.



7.1 Monitor and Control

Once the baseline plan has been developed and execution is underway, the PM manages any variance to the baseline. Figure 7-1 notes the main components of the monitoring and controlling processes.

Figure 7-1: Change Control Process Main Components



The main integrated change control processes are:

- **PDP –** The PDP serves as the baseline from which to monitor, control, and report specific project activities. The objective is to have the appropriate performance measures to identify potential change events and take corrective actions.

- **Monitor Performance –** The purpose of the monitoring process is to identify potential problems early to prevent unfavourable events or minimize their impact. Integrated change control provides a process for managing changes, once they are identified. Performance reporting provides insight into potential and realized issues. Performance reporting is covered in Section 7.5.
- **Change Identified –** Once a change event has been identified as potential, forecast, or real, the PM takes specific actions identified in the change control process to manage the change.
- **Change Analyzed and Quantified –** The PM analyzes and quantifies changes from respective baselines. The baselines could be either the product/service requirements or project-based criteria such as scope, cost, or time. The PM quantifies the change and determines whether the change is warranted. With each change, the corresponding business case benefits must be continually assessed and updated. The change is vetted with the appropriate approval authorities such as Project Sponsors, operations staff, Business Owners, or others identified in the PDP as having authority to approve specific changes. The review will result in the change decision.
- **Change Decision –** Under the change decision results in the change either being accepted or rejected:
    - If the c**hange is accepted** it must be approved and acted upon in a timely and efficient manner.
    - If the **change is rejected** the affected party must be informed and any fall-out managed using either the project issue resolution process or the procedures in the contract documents.

The industry generally recognizes that some change will occur, and they should be accommodated within the applicable contract. The PM monitors the changes and determines whether they are reasonable or excessive (i.e., indicative of errors or omissions).

7.1.1 Monitor and Control Scope

Controlling scope is the process of monitoring the status of the project scope and managing changes. The goal for project delivery is to achieve the benefits defined in the business case without any unwarranted changes to the scope. The assessment and quantification of changes in scope are always referenced to the approved baseline:

The following sources provide the source of the baseline for scope control:

- **Scope Statement –** The PDP includes a scope statement describing the project in broad terms. The statement is important, as it provides a common definition, which promotes understanding and buy-in among stakeholders. The PM must track the project and check for alignment to the scope statement to maintain the confidence of the stakeholders, who may not know the details of the contracts.
- **Project Delivery Plans –** The PDP and PXP identify detailed project management and product delivery tasks for each deliverable that must be monitored and controlled. Their work plans include the detailed task descriptions for studies and designs that state what is to be done and what is to be delivered for each task. The PM must monitor progress against these deliverables and identify deviations.
- **Product Deliverable –** Specific details of the products often evolve through the project life-cycle. The scope definition may change from the study to the preliminary engineering and design services. The changes must be monitored and the project controlled accordingly.
- **Contracts –** Contracts always provide some form of a scope, in terms of either specific deliverables or performance.

- **Plans and Specifications –** The scope for construction projects is packaged into much smaller components using drawings and specification clauses. The contract usually requires each component to be included to result in the final product. Unless the project is performance based, the scope of the project can be tracked and controlled through the specifications. The work is expected to be completed in accordance with the contract, and the deliverables are expected to be submitted as defined. If this is not the case, the work is considered non-compliant if it is deficient or incorrect. If unspecified work is completed, completion is out of scope. It is the PM's responsibility to proactively monitor and manage the work and, when there are issues, to manage the scope. The City's GCs and relevant contracts must be consulted for dealing with scope changes. The GCs define how to manage scope changes, how to compensate for them, and how to manage disputes.

7.1.1.1 How to Verify Scope

Verifying scope is the process for formalizing acceptance of the completed project deliverables. It involves reviewing the deliverables with the Project Sponsor and customer and formalizing acceptance. Verifying scope is the final step of the QA review for each of the deliverables and the final product, service, or result. Scope verification can be achieved through the use of final acceptance certificates.

7.1.2 Monitor and Control Costs

Controlling costs is the process of monitoring the financial status of the project and managing changes. All project delivery chain component costs must be monitored, including not only the largest and most obvious consultant and construction costs, however multiple other costs and fees, as described in Section 5.2.

The PM must proactively monitor and manage costs, reviewing the project routinely to confirm that costs and expenditures are as planned. The process includes:

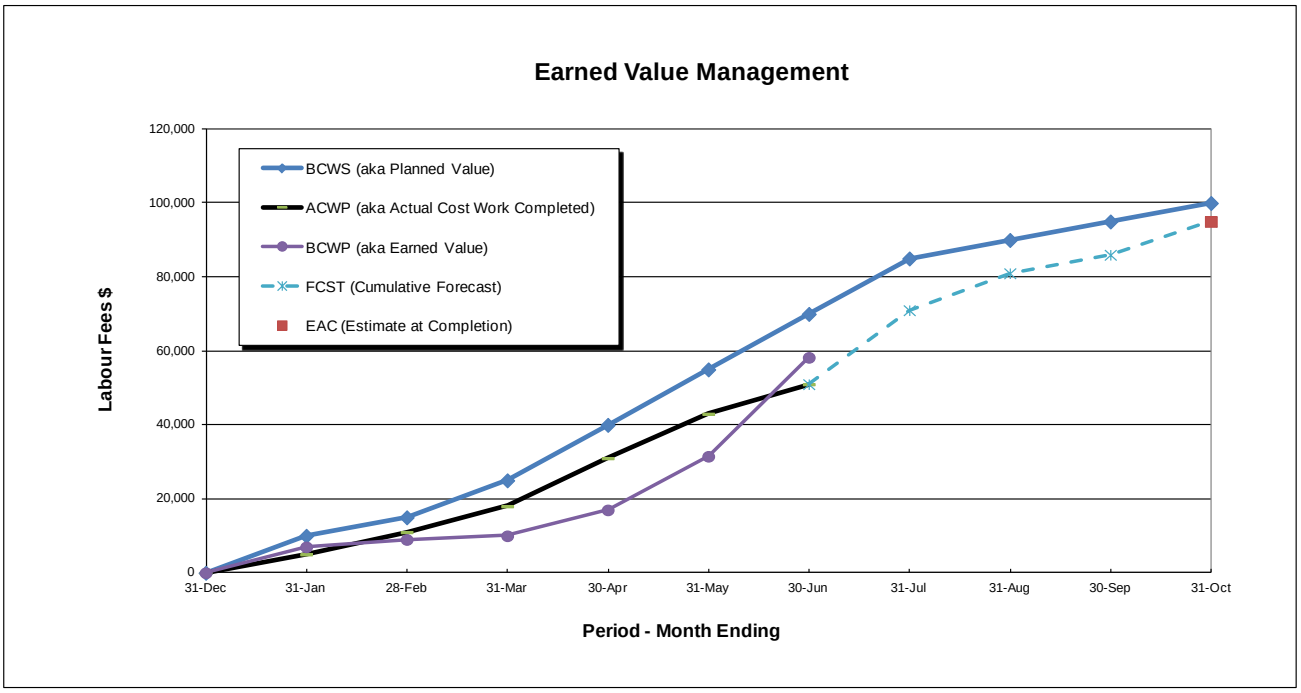
- Review and update costs and expenditures regularly.
- Account for any additional and unanticipated costs as soon as possible.
- Identify and track potential changes and additional expenditures.
- Account for inflation and other types of escalation throughout the project.
- Develop Estimate at Completion (EAC) forecasts on cost and performance trends.

All these costs, when added together and forecast to project close-out, must be within the approved budget. If they are not, the PM must inform the Project Sponsor and a recovery plan must be produced and added to the PDP.

The key to monitoring costs is to have a well-defined WBS with work packages that can be readily measured and compared to their budgets.

Routine monitoring and reporting is completed using the Earned Value Management (EVM) method. The EVM report integrates scope, schedule, and costs, providing complete information on progress and performance, as shown in Figure 7-2.

Figure 7-2: Example Earned Value Management Report



The EVM provides a graphical representation of project performance. It also provides the basis for variance indicators.

- Schedule variance is a measure of schedule performance equal to the earned value minus the planned value.
- Cost variance is a measure of cost performance equal to the earned value minus the actual cost.

Progress payments must be billed in accordance with the contractual agreements. The only acceptable method for changing the amount to be billed is through a formal scope change (change in services).

Even with proper planning, execution, and safeguards, contract amounts do change. The PM must always be aware of circumstances and prepared to deal with changes. The GCs allow for scope changes proposed by either the vendor or the City and define how the fees are to be adjusted. The City has the right to change the services at any time, and the Consultant may request changes through a change request process.

Conventional contracts are based on lump sum or unit price payments. There is a contractual obligation to perform the specified work for the approved price. While both Consultants and Contractors are vendors and similar contract administration is carried out by the City, each type of contract is governed by a different set of GCs and must be administered accordingly.

Unit price contracts are amenable to most types of changes since the quantities are only estimated in the contract and final payment is made to the actual final measured quantity. For lump sum contracts, the quantities are thought to be known when the specifications are drafted, and payments for different quantities cannot be made without a formal scope change.

7.1.2.1 How to Prepare an EVM Report

The example provided in Table 7-1 illustrates how to perform EVM calculations.

Table 7-1: Earned Value Management Example

WBS	Tasks	Labour Budget	31-Dec	31-Jan	28-Feb	31-Mar	30-Apr	31-May	30-Jun	31-Jul	31-Aug	30-Sep	31-Oct
BCWS (aka Planned Value)													
1.1.1	Deliverable 1												
1.1.1.1	Task 1	$10,000		$10,000									
1.1.1.2	Task 2	$20,000			$5,000	$10,000	$5,000						
1.1.1.3	Task 3	$25,000					$10,000	$15,000					
1.1.1.4	Task 4	$30,000							$15,000	$15,000			
1.1.1.5	Task 5	$15,000									$5,000	$5,000	$5,000
	Monthly Total	$100,000	$0	$10,000	$5,000	$10,000	$15,000	$15,000	$15,000	$15,000	$5,000	$5,000	$5,000
	Cumulative BCWS		$0	$10,000	$15,000	$25,000	$40,000	$55,000	$70,000	$85,000	$90,000	$95,000	$100,000
ACWP (aka Actual Cost Work Completed)													
1.1.1	Deliverable 1												
1.1.1.1	Task 1			$5,000	$1,000			$2,000					
1.1.1.2	Task 2				$5,000	$7,000	$3,000						
1.1.1.3	Task 3						$10,000	$10,000					
1.1.1.4	Task 4								$8,000				
1.1.1.5	Task 5												
	Monthly Invoices (Labour)		$0	$5,000	$6,000	$7,000	$13,000	$12,000	$8,000				
	Cumulative (ACWP)		$0	$5,000	$11,000	$18,000	$31,000	$43,000	$51,000				
BCWP (aka Earned Value)													
1.1.1	Deliverable 1												
1.1.1.1	Task 1			70%	80%	80%	80%	90%	90%				
1.1.1.2	Task 2				5%	10%	20%	50%	100%				
1.1.1.3	Task 3						20%	50%	90%				
1.1.1.4	Task 4								20%				
1.1.1.5	Task 5								5%				
	Total												
	Cumulative BCWP		$0	$7,000	$9,000	$10,000	$17,000	$31,500	$58,250	$0	$0	$0	$0
ETC Estimate to Complete													
1.1.1	Deliverable 1												
1.1.1.1	Task 1												$2,000
1.1.1.2	Task 2												$0
1.1.1.3	Task 3												$2,000
1.1.1.4	Task 4												$25,000
1.1.1.5	Task 5												$15,000
ETC (Estimate to Complete)													$44,000
EAC (Estimate at Completion)													$95,000

The example is for a project valued at $100,000 to be completed between January 1st and October 31st. The table is constructed according to the WBS with the work packages rolling up to deliverables, and the deliverables rolling up to project phases (only selected items from the WBS are shown in the table for brevity). The evaluation may be done for the entire project as a whole, or viewed in portions if required. The EVM can include only the labour component if it is primarily a services project as is shown in the table or the total project costs if the other components are of interest.

The risk reserve contingency and management reserve are not included in the project EVM since they are managed and controlled as separate items. Once the contingencies have been converted to project costs through a formal scope change they then become included in the evaluation.

The EVM is completed as follows:

- **Planned Value:** The budgeted cost of work scheduled (BCWS) is entered as planned for each task. This must include the work package level detail in the time increments to me monitored and controlled.
- **Actual Cost of Work Completed:** Actual costs are based on the most current information available, which in many cases may be consultant or contract billings.

- **Earned Value:** An earned value estimate is entered for each item for each time increment based on a bona fide estimate of the work completed. The example is structured in terms of percent completed.
- **Estimate to Complete:** The estimate to complete is a bona fide estimate of the amount of work remaining to be needed to complete each work package for each time increment. The value is reported in terms of cost estimates to complete, however the basis for estimating would normally be in terms of working time.
- **Estimate at Complete:** The estimate at complete is calculated from the addition of the cumulative ACWC and ETC.

The EVM is normally presented in graphical format as shown in Figure 7-2. The trend lines for the example were plotted in Excel based on the cumulative rows highlighted in the table. One additional trend is included in the table for the cumulative forecast (FCST), which can be included if additional detail is required beyond the EAC.

7.1.2.1 EVM Template

No template for EMV is being developed as MS Project has this feature embedded.

7.1.2.2 How to Prepare Recovery Plan

Cost overruns create concern because of the risk of exceeding the project budget and having insufficient resources to fully fund the project. The PM must report on the reason for the discrepancy and identify a method of recovery. If recovery can be achieved through corrective actions within the current work plan and contractual requirements can be met without changes to baselines, a formal recovery plan is not required.

If the variation from plan is more significant and greater action is required, a recovery plan must be developed and included in the PDP. The recovery plan may include changes such as redesigning products or reducing scope.

The PM must be prepared to deal with over expenditure forecasts through the integrated change control process described in Section 7.3.

7.1.3 Monitor and Control Schedule

Controlling the schedule is the process of monitoring the project and product schedules and managing changes. The schedules are defined in the PDP and in the consultant and construction contracts. It is the PM's responsibility to proactively monitor and forecast the schedule.

A schedule with well-defined tasks facilitates its management. Knowing the expected duration of each task allows estimation of the completion time for comparison with the schedule.

Contracts specify that work will be completed in accordance with the schedule. If it is not, the work is contractually non-compliant. Any changes to the schedule must be formally approved through the consultant or construction change process. As part of the integrated change control process (Section 7.2), the PM must update the baseline schedule for all approved schedule changes and assesses how the changes might affect the entire project.

The PM is responsible for initiating or taking corrective action if the progress or updated schedule does not conform to the currently approved schedule. Corrective actions may involve adding more resources, working longer hours, or changing how the work is performed.

7.1.4 Monitor and Control Quality

QC is performed throughout the project, and is monitored and recorded to assess performance and recommend changes. Quality standards are used for the monitoring and controlling processes.

The PDP will include a QMP for internal project management services and for the overall project delivery chain. Consultants should have an internal QA/QC plan, which provides an additional QA measure for the PM. For construction projects, the CA monitors quality directly. Product quality standards must be included in the specifications, and the Consultant, the Contractor, or a third party must take the identified site QC measurements. The CA must confirm through the QA process that QC is taking place.

Failure to meet quality is serious; if quality concerns arise, the PM must define the problem and take corrective action.

7.2 Perform Integrated Change Control

Integrated change control is the process of managing all change requests to baseline project documents and deliverables, . Changes are often much more complex than they appear, a change to any one of the four objectives (scope, costs, schedule, or quality) is likely to impact at least one of the others, creating the need for an integrated change control process.

Changes can be a useful tool to enhance a project, however they should only be approved if they add value. If they do not add value, changes should be rejected. The disadvantages to changes are that they can unexpectedly add to the project budget and suggest that the project was originally poorly planned or designed or, is being poorly managed, a perception that may or may not be accurate.

This PMM identifies a comprehensive change process applicable to the entire project delivery chain. Routine changes originating from consultant services, construction contracts, or any other sources must be evaluated with respect to the project objectives and baselines. Direct and indirect impacts of the change must be identified and considered before the change is approved. The process integrates contingency management and administrative over-expenditure procedures.

Baselines are critical to the change process as they provide the reference and measuring point from which changes are evaluated. A thorough and accurate PDP as described in Section 5 and comprehensive contracts as described in Section 6 are essential to the process.

The GCs for consultant services and construction contracts include processes to address changes. Scope changes may address any component of the project objectives —scope, costs, schedule, or quality—and may involve either additions or deletions. The PM is responsible for reviewing and managing all consultant changes in a timely manner according to the contract, while the CA is responsible for processing of construction contract changes.

The GCs for both consultant and construction contracts require change requests to be documented and to include:

- Reason
- Detailed description
- Financial impacts

The GCs provide for the following alternative forms of pricing for changes:

- Lump sum
- Unit prices
- Cost plus

The integrated change control process requires indirect impacts of the change be identified. For example, scope may affect schedule, and a minor change may have a major impact. The information needed to assess the overall impacts must be requested and evaluated before the scope change is approved. The only exception is for a mandatory change, for which either there is no option or time is of the essence.

After the merits and options for change orders have been reviewed and the change is approved, it must be signed and returned to formalize the change and update the contract. For consultant contracts, the PM must review the budget impacts and the rules on over-expenditure before signing the change order. For construction contracts, the change is reviewed by the CA, who has the authority to act on behalf of the City. For most situations the CA will consult with the PM prior to signing to assess the budget and other potential impacts. In urgent situations, the CA may independently approve the change within their delegated authority.

A change tracking system must be maintained for all project changes. Separate logs should be kept for City project management changes, consultant changes, and contract changes. The logs should include the steps of the changes, the dates, the persons responsible, and the results.

Anticipated changes are also to be included in the log. Frequently, the project team is aware of a potential changes, and tracking it increases the accuracy of financial forecasting.

All changes must be formally approved, which in effect makes a change to the contract, and the baselines must be updated to reflect the revisions.

The sum of all the estimated project costs, including updated contingency allowances, is used to forecast the EAC (estimate at completion) as defined in Section 7.1.2. The EAC should be updated and compared with the approved budget regularly and with every major change. The EAC must on exceed the approved capital budget or a recovery plan is required. If the recovery plan involves increasing the budget, either an over-expenditure or a re-budgeting process may be required.

Scope changes are a concern when there are too many or the cumulative cost is too high. A high value of scope changes may indicate they are being used to compensate for inaccurate or deficient work. The PM must manage a process for categorizing changes to track their origin and reason.

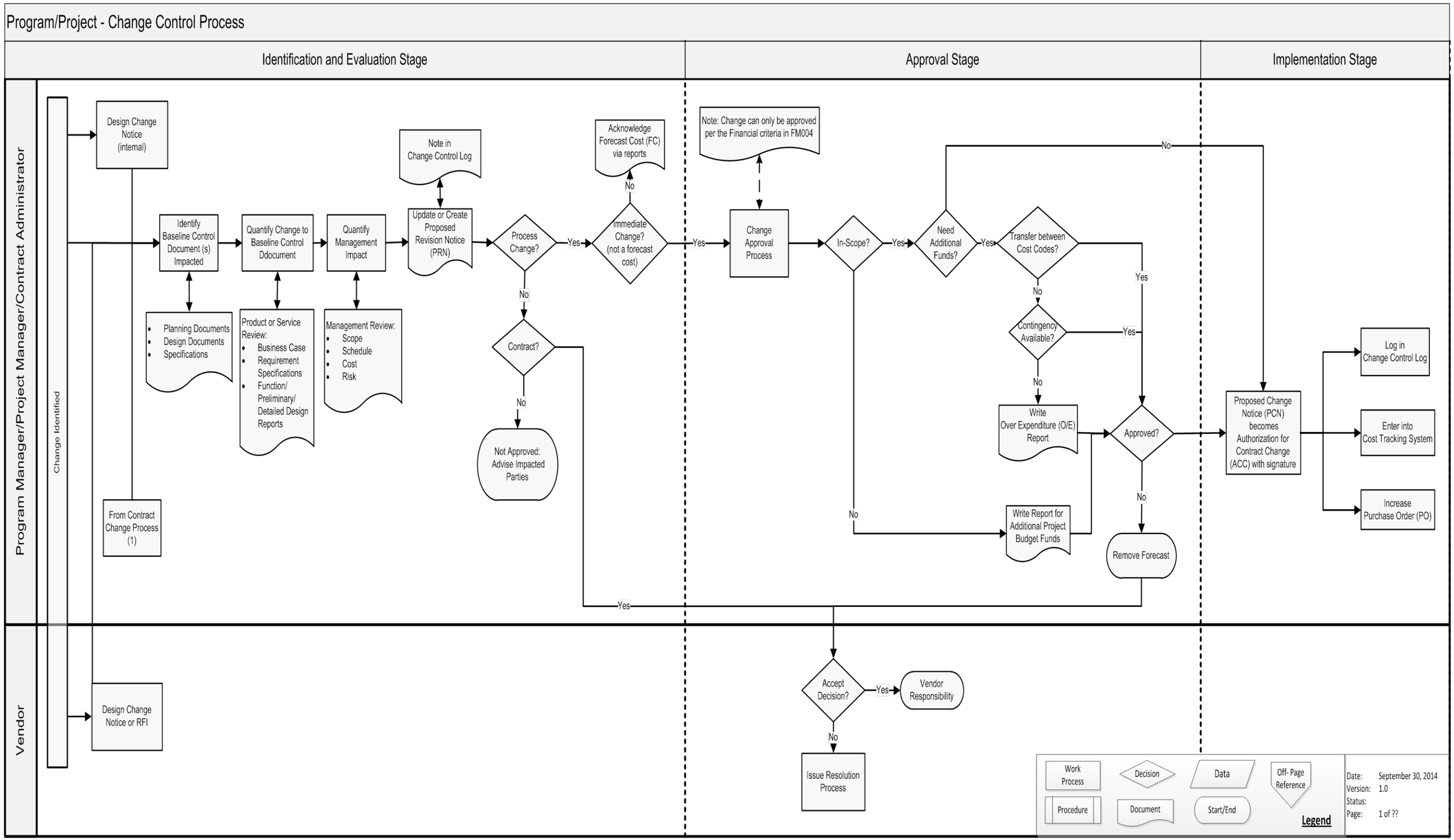
7.2.1.1 How to Perform Integrated Change Control

Integrated change control takes place at the program (or project) and contract levels, as described in the following sections.

1. Change Management Process—Program or Project Level

The project-level change management process chart is shown in Figure 7-3.

Figure 7-3: Integrated Change Control—Project Change Control Process Chart



Identification and Evaluation Stage

Changes can be triggered by a variety of sources, including contract changes, or from stakeholder or Business Owner requests. In the identification and evaluation stage, the source and type of the change must be recorded in the request for information (RFI) log, which is used to manage all identified issues and track their disposition.

On major projects the PDP may identify that the PRI method is to be used for change tracking. A sequential number would be assigned to the issue at this point if it is used, and the issue would be tracked by the number for all subsequent references to the issue.

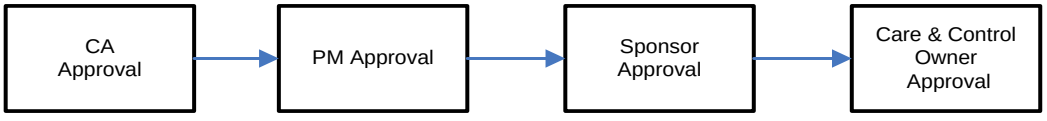
The identification and evaluation stage also includes:

- **Baseline Control Impact –** The PM must identify the product or service impact per the documents used to define the product being delivered. A needed design enhancement or modification could result from constructability concerns or design errors and could impact the project or contract scope, cost, quality or schedule. The PM must assess and quantify the change according to guidelines in appropriate baseline documents such as studies, design documents.
- **Management Impact –** Once the change has been identified, the PM must quantify the impact of the potential change and its magnitude in terms of effects on the PDP (quality, cost, time, risk) and the benefits identified in the business case.
- **Revision Notice –** The revision notice form captures and documents the data gathered as a result of assessing the impact of the change. The revision notice is logged into the change control log to track the change status and to monitor future performance of the types and magnitude of changes. The performance reports developed at the project close-out are to be used in a continual improvement process. If a Project Management Office (PMO) exists, these measures will be assessed across the portfolio of projects to improve the project management process.
- **Process Change –** The PM determine whether the change has been forecast, is imminent, or has occurred. For a forecast change, the impact may or may not occur, so the PM logs the revision notice and records the cost impact as pending so the cost is recorded in the forecast cost report. If the revision notice is to be formally considered for approval, the PM typically discusses the change with the impacted groups such as vendors, team members, Project Sponsors, the Business Owner, and operations personnel. If the change is not approved, the impacted party is notified. In a contract environment, the contract-level formal change management process discussed in the next section is followed. If the change is not in a contract environment, the PM notifies the impacted party (the internal stakeholder or delivery team member) by email or a method appropriate for the type of project.

Approval Stage

The approval hierarchy for each project may be different and should be defined in the PDP. The typical approval hierarchy is shown in Figure 7-4.

Figure 7-4: Change Approval Hierarchy



According to FM-002, the revision notice cannot be approved unless sufficient funds exist for the change. Therefore, the PM must decide when to process the revision notice considering funding availability and the need for the change to proceed. The PM may process a revision notice considering unspent funds in the project budget, with the understanding that additional funds will be required at a future time. In this case, an over expenditure report or additional budget fund report will be submitted.

If the change is for new scope not identified in the PDP, the PM obtains new funds rather than taking funds from the contingency allowance, which is reserved for a known-unknown or unknown-unknown events. If these events were to occur and the contingency had been depleted, the PM would need to justify additional funds for needs that had already been identified. The PM will need to determine when the over-expenditure report should be submitted relative to the project status.

To gain additional funds, one of the following methods is used:

1. Access any available funding from the project's cost codes (other deliverables)
2. Access contingency funding that may be appropriate (such as a risk event that has passed or been mitigated)
3. Write an over expenditure report to obtain funding from other sources within the department. See section

Implementation Stage

If funding has been obtained, the revision notice can be formally approved. Once approved, it becomes a change order that can be entered into the change log and cost tracking systems. If the change is for a contract, the PO will need to be increased.

2. Change Management Process—Contract Level

The contract-level change control process chart is shown in Figure 7-5. Key steps in the process are:

- **The vendor or City identifies a change and submits an RFI –** When a Change in the Work is contemplated at the contract level the CA shall compile all technical details supporting the contemplated change and complete a PCN form. Prior to issue of the PCN to the Contractor, the CA shall review the contents of the PCN with the City PM. If the City is in agreement, the PCN shall be forwarded to the Contractor for their action. If the PRI method of tracking is used it should be identified on all correspondence.

  The Contractor will review the contents of the PCN and will respond with a written quotation identifying the increase, decrease or no change in amount on the Contract Price as well as any schedule impact the contemplated Change in the Work will have on Contract Time. A reasonable period of time (typically 5-10 days) for the Contractor to respond to the PCN should be stated on the PCN as well as the method for valuation of the contemplated change (refer to GCs). The CA shall maintain a log of all PCNs and their status.

  When receipt of the Contractors response is in hand, the CA shall record the date of the response and the amount in the PCN Log. The CA shall promptly review the cost proposed by the Contractor and if not acceptable, shall request the Contractor to provide further substantiation of the costs. If the proposed costs are acceptable to the CA, the CA will obtain approval from the City PM to initiate an Authorized Contract Change.

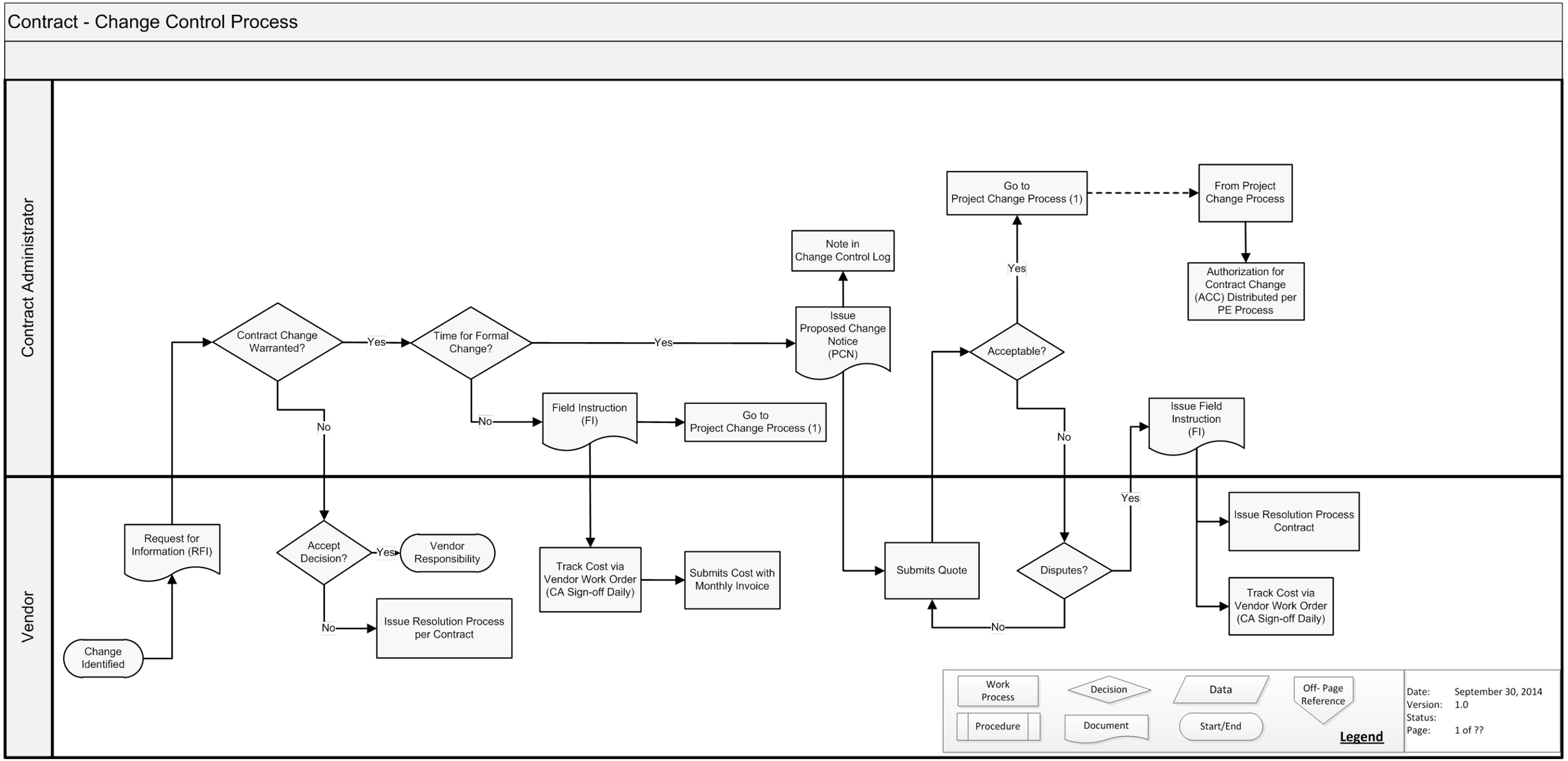
  If either the PM or CA become aware that the contractor performing the work prior to approval, the CA shall immediately issue a stop work order to the contractor. Under the legal concept of unjust

enrichment, if the City is aware the contractor is performing the work and does not stop it, the City will be responsible for the expense. This also is contrary overriding principle of the change control process in that the cost is known in advance of the work.

The PM logs all identified requests or queries that could affect the project on the RFI log, which helps track and manage all identified issues and their disposition.

- **The CA decides whether a contract change is warranted** – The CA assesses each change to determine whether it warrants further investigation or further information is needed. This step helps avoid unnecessary involvement of others. If the change warrants a more detailed review, the change is first assessed for its impact on the contract. If it is time critical (for instance, if the work needs to be completed relative to the schedules of other work), the change should precede according to a formal field instruction and the contract conditions.
  - **If change is rejected –** If the CA and vendor cannot agree on the terms of the change, the CA directs the vendor to proceed based on the CA's decision. If the work needs to occur, the CA can direct the vendor to proceed based on a cost-plus method. The vendor can also follow the issue resolution process in the contract. If the work is not critical and is a contractor-originated issue, the vendor can follow the disputes resolution process specified in the contract.
  - **If change is warranted:**
    - **Field instruction –** If there is insufficient time to process a change request because the work must proceed, a field instruction is provided to the vendor with the understanding that the change will be assessed according to the project change process. The field instruction directs the vendor to proceed under specific conditions that are defined in the contract. At this point the process reverts to the Program/Project change control process (connection point 1 on Figure 7-3)
    - **Revision notice –** Under normal circumstances, sufficient time should exist for the CA to issue a revision notice to the vendor to obtain prices for the change. Once the CA accepts the revision notice with the price from the Contractor, the revision notice can follow the formal change process. At this point the process reverts to the Program/Project change control process (connection point 2 on Figure 7-3)
- **If the formal change process is successful:** Process follows the project change process and an Authorized Change Order is issued.
- **If the formal change is unsuccessful:** The quote may be resubmitted for further consideration, however if this becomes unsuccessful and the change is required, the CA will issue a FI and the process will follow the issue resolution process.

Figure 7-5: Integrated Change Control—Contract Level Change Control Process



7.2.1.2 Integrated Change Control Templates

Templates for Change Control are provided in Appendix B.

7.3 Manage Contingencies

Changes are recognized as a reality in project delivery, and the change process is an industry accepted practice. Most projects are setup with contingency budgets to accommodate moderate changes, as defined in Section 5.3, and described for risk in Section 5.9.

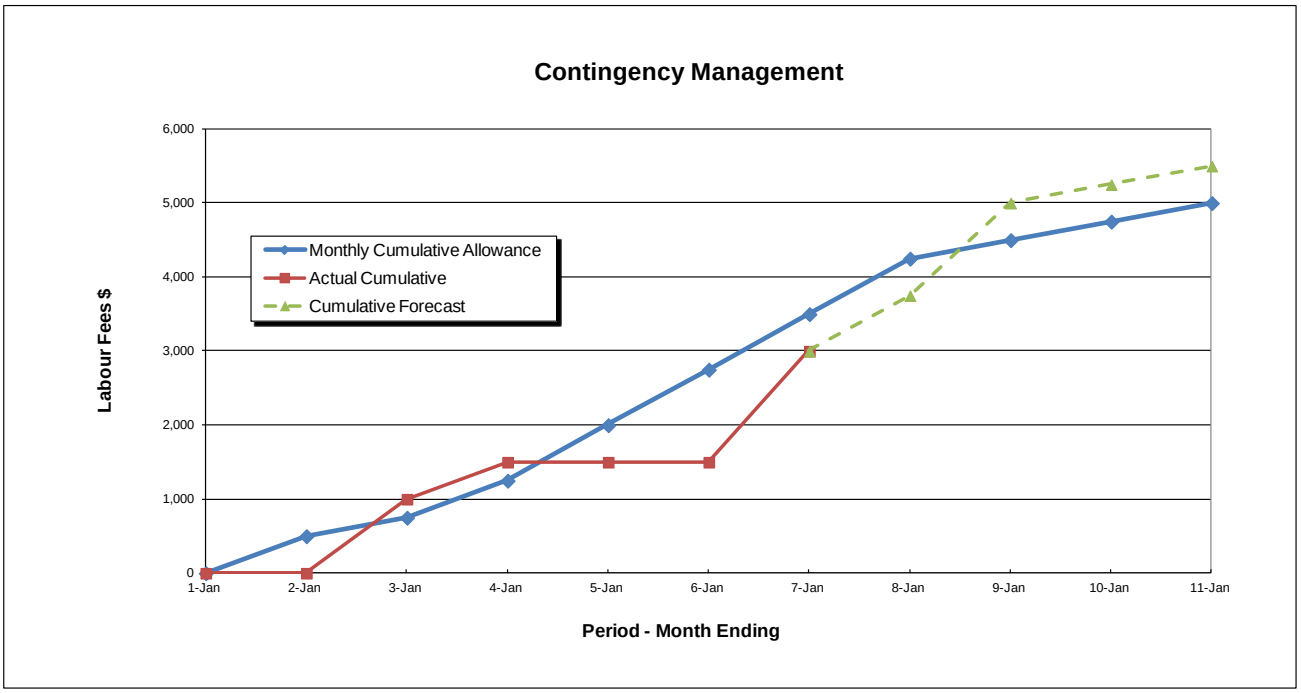
The PMM identified the following contingency types. Each is to be managed uniquely according to its purpose and defined expectations:

- **Cost-estimating contingency** – The cost-estimating contingency is referenced for completeness here, however it is not part of the formal scope change, project or product monitoring and control processes. The cost-estimating contingency for the product is replaced at the contract award stage with the capital cost allowance.
- **Capital cost allowance –** The capital cost allowance is established for changes to construction and sometimes consulting contracts based on normal industry practice. The amounts are monitored and controlled through the scope change process. To avoid unexpected overruns, it is important that the actual amounts be tracked and compared with the allowance value remaining.
- **Risk reserve –** Risk reserve contingency is a separate budget amount added to the project budget for any risks warranting a contingency risk response. Continual risk review is required. As risks are realized the risk contingency is released by change order to compensate for the consequences of the risk as required. This in effect draws down from the contingency and increases the project cost. Outstanding risk allowances are tracked and compared to the budget. If the potential risk event passes without being realized, the contingency value reserved for the risk may be retired. The retired funds then become surplus to the budget and are allocated according to the PDP or sponsor's discretion.
- **Management reserve –** This contingency is controlled by the sponsor and is managed through the change process if the change directly impacts the project or product delivery.

7.3.1.1 How to Manage Contingencies

The capital cost allowance, risk reserve and management reserve contingencies as identified in the PDP are included in project budgets for specific reasons and must be tracked and managed to fulfil those needs. They will have separate WBS codes and can be tracked much like the project budget and cost values using the EVM approach. Figure 7-6 shows an example of tracking a capital cost allowance.

Figure 7-6: Example Earned Value Management Report for a Project Contingency Account



The rate of expenditure can be estimated considering the expected rate of progress and knowledge of when contingencies are most likely to be drawn (risk event is expected to occur). New information can be applied to the forecast as the project proceeds to estimate the contingency expenditure at completion. This tracking method and forecast provides a useful tool for anticipating problems.

Contingency is released to deal with the consequences of the specific risk event when it is realized.

- For the capital cost allowance the risks are unknown-known, which means a variety of risk events are expected to occur however the extent of expenditures is somewhat predictable. An example in practice may be the release of funds for scope changes on a construction contract for situations such as encountering an unmarked utility during an excavation.
- The risk reserve provides a contingency to deal with two types of risks, systemic which are unknown-known and project-specific which are known-unknown. The risk quantification process of Section 5.8 can be used to quantify both of these risks. The systemic risk is managed much like the capital cost allowance, while the project-specific risks are managed based on the discrete risks.

The use of contingency is expected to be variable because by its very nature it deals with uncertainty. If the budgets have been established at a high confidence level as described in Section 5.8, then in most cases the projects will close with a surplus contingency amount. A strategy needs to be established for how to deal with surplus contingencies.

- For the capital cost allowance the expenditures could potentially arise at any time and unless there is a large disparity between the forecast and actual cumulative expenditures, the surplus should not be retired or re-allocated until completion of the project it was intended for.
- The risk reserve contingency allocated for systemic risks is much like the capital cost allowance, and unless there is a large disparity between the forecast and actual cumulative expenditures, the surplus should not be retired or re-allocated until completion of the project it was intended for.

- The risk reserve will have discrete amounts identified for project-specific risk events. Once the chance of the risk has passed or been eliminated the contingency is theoretically not required. The options for managing the surplus in these cases are as follows:
  - *Retire the risk and reallocate the budget:* After the potential for a risk has passed the risk quantification described in Section 5.8 can be recomputed with the risk removed, and a new contingency value determined. The difference in the calculation between the original and reduced risk will be the amount that can be retired or reallocated.
  - *Retain the risk amount in the risk reserve contingency:* The risk reserve allocations for project-specific risks will only partially cover the consequences if the risks are realized. As the project proceeds and the number of remaining risks reduces, there will be a reduced amount of shared risk contingency available if the contingencies are progressively retired. It is therefore prudent to retain some of the contingency in case of a risk occurring late in the project.
  - *Release all outstanding risk contingency at the end of the project:* Projects structured with the contingency vales set at high confidence levels are likely to at least periodically result in significant amounts of risk contingency remaining at the end of the project. This surplus is then available to be reassigned based on established budgeting procedures.

7.3.2 Over Expenditure Procedures

Procedures for over expenditures and the delegated authority to approve them are set out in Appendix 7 of Administrative Standard FM-002. The following is a summarization of those procedures. In case of disagreement, the Administrative Directive shall take precedence.

Accumulated change orders that do not cause the contract to exceed the amount of the award can be approved by the Contract Administrator. Accumulated change orders that will cause the contract to exceed the amount of award cannot be approved by the Contract Administrator and requires additional approval by way of over expenditure report. The level of approval required depends on the delegated approval authority as set out in Administrative Standard FM-002.

Under FM-002 the CAO delegates his/her authority to the CFO to approve over expenditures where the accumulated over expenditure does not exceed $5 million dollars and there is available capital or operating budget as approved by Council. For clarity, the accumulated over expenditure means the accumulated amount of the over expenditure only, and is not the total contract amount, including over expenditures.

Under FM-002 the CFO further delegates the following:

- All Department Heads can approve over expenditures within budget as long as the total contract value including over expenditures does not exceed $5,000
- The Department Heads of Planning Property & Development, Public Works, Transit and Water and Waste can approve over expenditures within budget as long as the total contract value including over expenditures does not exceed $100,000
- The Department Heads of Planning Property & Development, Public Works and Transit can also approve over expenditures within budget for total contract values beyond $100,000 as long as the amount of the over expenditure does not exceed 20% of the original contract value, to a maximum of $250,000

- The Department Head of Water and Waste can also approve over expenditures within budget for total contract values beyond $100,000 as long as the accumulated amount of the over expenditure does not exceed 20% of the original contract value, to a maximum of $500,000

In instances where the amount of the over expenditure exceeds the CFO's delegated authority of $5 million, but it is within the budget approved by Council, the over expenditure may be approved by the relevant standing policy committee.

In instances where additional budget is required to cover the over expenditure, the over expenditure must be approved by Council.

The above is summarized in Table 7-2 below.

Table 7-2: FM-002 Over Expenditure Approval Levels

Over-Expenditure Approval Levels			
Change Order(s)	Project Budget	Required Approval	Comments
Accumulated change orders do not cause total contact to exceed the amount of award	Within Budget	Contract Administrator	Contract has been awarded and approval of change order will not increase the contract value beyond the amount of award
Accumulated change orders increase contract beyond award amount but within Department Head Authority	Within Budget	Department Head	Department Heads of PPD, PW & Transit - $100k or 20% of original contract value to max of $250k Department Head of WW - $100k or 20% of original contract value to max of $500k All other Department Heads can approve over expenditures as long as the total contract value does not exceed $5
Accumulated change orders increase contract beyond award amount but within CFO Authority	Within Budget	CFO	CFO has authority to approve accumulated over expenditures up to $5m
Accumulated change orders increase contract beyond award amount and over CFO Authority	Within Budget	Relevant SPC	SPC can approve over expenditure reports over the CFO's delegated authority as long as it does not exceed the approved budget
Accumulated change orders increase contract amount over Council approved Budget	Additional Budget Required	Council	Any project that requires additional funding requires Council approval. Alternative funding sources are identified and recommended in the over expenditure report

In some instances on construction projects, obtaining the approval in advance of the change order would cause construction to halt and result in delay claims adding additional cost to the City. In these instances and ***where there is approved budget available in the project***, the PM may use their professional judgment and obtain administrative approval after the fact. In these instances, it may be beneficial for the PM to obtain approval via e-mail with formal report to follow. Approves may prefer to accumulate changes and consolidate in a single administrative report towards the end of the project.

In instances where the over-expenditure will cause the project to exceed budget, Administration does not have the delegated authority to approve. The additional budget can only be approved by either relevant SPC or Council. As such, the PM should not be approving changes beyond budget as it exceeds administrative authority and essentially commits the City to additional expenses without Council approval.

7.3.3 Funding Over Expenditures

FM-004 authorizes departments to transfer funds from a non-specified capital account to cover over expenditures. Reallocations are permitted to a maximum of $100,000 or 25 percent of the base budget.

In instances where the over-expenditure will cause the project to exceed budget, Administration does not have the delegated authority to approve. The additional budget can only be approved by either relevant SPC or Council.

7.4 Manage Risks

Monitoring and controlling risks is the process of implementing risk response plans, tracking identified risks, and identifying new risks. Risk management must be carried out according to the RMP schedule, which at a minimum includes reporting to the Project Sponsor, Major Capital Project Steering Committee and/or Project Advisory Committee at the start of all new project phases or as defined in the PDP.

The risk register identifies the primary inputs for this process, including the risk owner, the risk response, and actions taken. The risk owner performs the identified actions, evaluates the situation as conditions change, and provides update reports

The risk assessment includes a review of the risk contingency reserve. If the amount in the reserve exceeds the amount of risk remaining, a recommendation should be made to reduce the contingency. Once a risk has been eliminated it must be closed.

7.5 Report Performance

Report performance is the process of collecting and distributing performance information, including measurements, status reports, and forecasts.

Routine project management activities include collecting information such as reports and logs that can be used for tracking and evaluating performance.

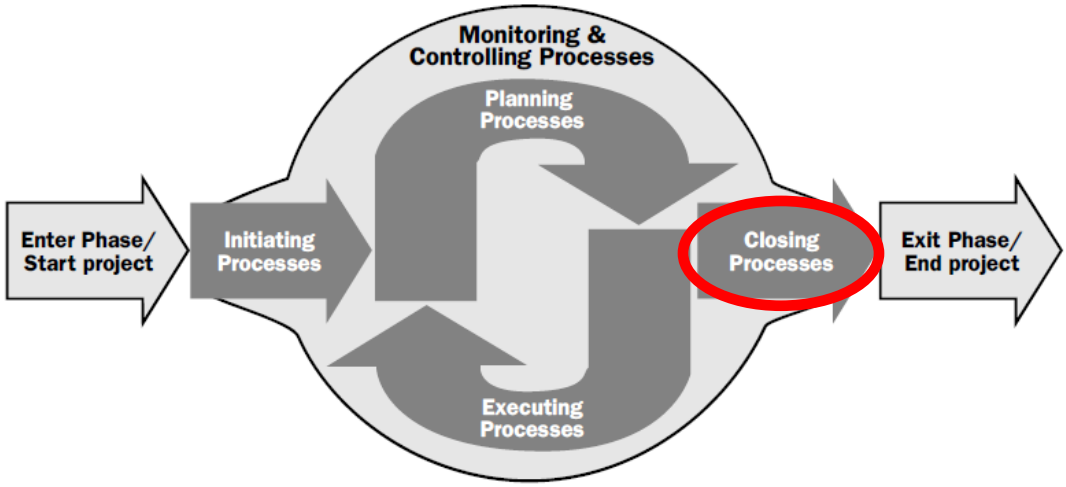
The PDP defines standard reports generally required for every project and ad-hoc reports required for specific projects.

The reporting process provides information critical to assess project performance that the PM must assess on an on-going basis to assess the performance of the project and make decisions. Of particular interest for tracking the project are:

- Monthly EVMs for the project as a whole and consultant and construction sub-projects
- A monthly EAC for the construction contract, consulting services, and the items comprising the total City budget.
- The PM checklist report indicating that the PMM requirements are completed.

8 Closing Process Group

Closing is the last of the five project management process groups.



8.1 Update Business Case

The phase gate approval process adopted for the PMM, illustrated in Figures 3-2 and 5-3, requires the business case to be verified, updated or finalized at the early phases of the project, and benefits confirmed for the later phases.

The progressive updating and confirming business benefits proceed through the entire life of the project in order to validate the initial investment. The project produces updated information that is used to update the assumptions used in the initial business case. If any of these assumptions change and have a negative impact to the benefits of making the investment, the project needs to be assessed and consideration given to re-scoping or termination. These decisions are typically make at the end of the planning phase stage gate where more detailed information has been produced to validate the assumptions made in the business case.

The PM Framework is designed such that the project produces information on the product in the early phases so that decisions can be made to cancel or delay the investment before spending the large dollars in the later phases.

8.1.1.1 How to Update the Business Case

The business case contains specific information and metrics that are unique to each project. The business case is updated by applying new information to the existing information, such as actual costs, and refined benefit estimates. It is important that the updates be based on the same baseline metrics to enable meaningful and credible comparisons.

All the information in the business case should be updated, including assumptions used in the need assessment, option analysis - cost evaluation, cost estimates and benefit determination.

For more details refer to the Investment Planning manual.

8.2 Close Project Phase

In the “close project” phase, all activities across the project management process groups are finalized to formally complete the project phase. A PDP status report summarizing project delivery is prepared along with either the business case update or benefit validation.

8.2.1.1 How to Close the Project Phase

The PM must confirm that all project phase work is complete and the phase objectives have been met. The PDP and work plan are used to determine whether the work has been completed and is ready for closure. All deliverables and transfers must be complete before a phase can be closed.

The phase closure assessment depends on the original business case. At a minimum it includes:

- Business case update or benefits validation
- Scope verification
- Report on scope changes
- Budget and cost updates, with EVM and EAC
- Schedule report
- Report on quality
- Risk register and report
- Issues log
- Project check list

8.2.1.2 How to Terminate the Project

At each phase gate in the project, a “go or no-go” assessment is completed based on the forecast cost of the project vs. the benefit of the investment. As the scope, cost, risk and benefits of the project get refined; the business case can be re-assessed with more realistic numbers to re-affirm the cost/benefit and residual risk of the not making the investment.

Typically upon completion of the class 3 estimate (after the planning phase) this decision is made with the Sponsor, Business Owner and in consultation with the Advisory/Steering committee. This assessment includes multiple factors such as value for money, risk assessment, level of service targets vs. willingness to pay and identified benefits.

8.3 Commission and Transfer

Many projects have special procedures that must be completed to provide the Business Owner with the information it needs to successfully take ownership of the operation and maintenance of the work. The PM coordinates with the Business Owner in planning and preparations for the information transfer, commissioning, and start-up of new work. Operating budgets are established and staff are trained to operate and maintain the product or service.

Commissioning and transfer includes the following:

- **Product Data –** Vendor and product information must be collected from the Contractors for all the materials and equipment received. This includes product sheets, operations and maintenance manuals, and shop drawings.

- **Record Drawings –** As-built drawings or record drawings are required to document the as-constructed status of the projects for operations, maintenance, and future repair of the assets and infrastructure. Timely preparation of drawings and operating manuals is imperative for operating facilities and must be completed as soon as possible, turned over to the PM for QA, and submitted to operations for the start-up process.
- **Training –** Product training is frequently required before the City can take ownership of the new equipment and its operation.
- **Commissioning –** This is a process for confirming that the components and systems have been installed as specified and can be operated and maintained according to the design intent. Commissioning is a process for validating product deliverable performance and also facilitates orderly transfer of the product from the constructor to the Business Owner.
- **Start-up –** For complex equipment, the Contractor, vendor, and manufacturer may be required to undertake a start-up process. This can involve the Contractor taking responsibility for operation of the equipment for a specified period to demonstrate its successful operation.
- **Transfer to Operations** – The level of effort and work required in transferring the completed work to the owning and operating business unit (department) depends on the scope and nature of the work. The transfer includes all the project records and new information required for operation and maintenance.
- **Update Asset Registers –** The AMM requires asset information to be captured in an asset register. If maintenance management systems are used, the asset information must also be recorded in the system and the operations and maintenance procedures must be documented. This function may be carried out by the Contractor, the Consultant, or the City, with the approach pre-established and identified in the PDP.
- **Tangible Capital Asset Updates –** The City maintains a register of its tangible capital assets consistent with public sector accounting requirements that must be updated with any additions or deletions that would typically occur during capital projects.

8.4 Review Consultant Performance

FM-002 states that Consultant performance evaluations should occur at least annually and that the review should be kept on file.

8.4.1.1 How to Complete a Consultant Performance Evaluation

The overall goal of consultant performance evaluations is to make consultants more aware of, and responsive to, the City's needs and expectations. An added benefit is that the evaluation should make consultants better at what they do.

Performance evaluations should be carried out based on the following principles:

1. The reviewer remains objective.
2. The meeting remains positive and the reviewer provides constructive criticism. Areas of strong performance should be noted as well as areas for improvement.
3. The evaluation process identifies and quantifies the City's expectations of the consultant's service. For example, the evaluator identifies what is expected in terms of meeting deadlines, communicating problems, accuracy in cost estimating, and accuracy in contract documents.

A standard form for consultant evaluations is provided on the City's website at http://www.winnipeg.ca/matmgt/templates/consultants/Consultant_Information_Page.stm.

8.5 Close Project

The final process is to close the project. Final closure can be extended well beyond commissioning and start-up because of deficiencies, finalization of manuals and as-built drawings, transfer of documents, and administration of the warranty period.

Close-out is required to:

- Complete the records management processes
- Finalize project deliverables and product turnover
- Document major changes made from the original business case to the final product
- Compare budgeted cost to final cost and explain major deviations
- Compare scheduled events with actual events and explain major deviations
- Summarize major problems or innovations developed during project delivery and assess their overall impact on the budget and the quality of the deliverable
- Complete and document a consultant performance review

8.5.1.1 How to Close the Project

The City's PM is responsible for receipt of formal documentation for completion of the contract, final inspections, and end of warranty. The PM updates final documentation, closes the project files, closes the project accounts, and completes the archiving process.

8.6 Prepare Lessons Learned

Identifying lessons learned is an important part of the continual improvement process for both the Consultant and the City. The process identifies the causes behind the aspects that worked well during the project and those that did not. Once enough lessons learned information has been gathered, recommendations can be made for changes, and the PMM is updated to capture the improvement.

8.6.1.1 How to Prepare Lessons Learned

The lessons learned are initially prepared by the PM and then turned over to the manager of capital projects for managing continual improvement. The lessons learned are developed through a sequence of reviewing the project performance results, identifying successes and areas in need of improvement, and interviewing representatives from the project team and vendors.

Appendix A Procedures

Initiation Phase - Design Bid Build (DBB)

Project Sponsor

Start

Approved Business Case

Assign Project Manager

Sign-off Project Charter?

Yes

No

Agree?

Yes

No

Approved?

Yes

No

Major Capital Project Steering Committee

Present Recommendation

Project Advisory Committee

Presented Project Delivery Plan (PDP)

P3 Review Committee

Meet Criteria, proceed as P3 Candidate PMM 5.6

Present Project Delivery Plan (PDP) ,if P3

Project Manager

Identify Stakeholders PMM 4.2, Template

Develop Project Charter PMM 4.3, Template

Assess Alternative Project Delivery (APD) Options PMM 5.6

> $10 M?

Yes

No

Establish Major Capital Project Steering Committee PMM 4.2

Private, Public Partnership (P3) Candidate PMM 5.6

Develop Project Delivery Plan (PDP) PMM 5.1, Template

Update Business Case, if required

Phase Gate Approval/ Close Initiation Phase (PMM 8.2)

P1

Establish Project Advisory Committee (PAC) PMM 4.2

Work Process

Procedure

Decision

Document

Data

Start/End

Off- Page Reference

Legend

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Version: 1.0
Status:
Page: 1 of ??

Planning Phase – Design Bid Build (DBB)

Preliminary Design Stage

PMO

Report Performance
PMM 7.5,
Templates

Project Sponsor

Report Performance
PMM 7.5,
Templates

Project or Major Capital Project Steering Committee

Report Performance
PMM 7.5,
Templates

Project Manager

P1

Delivery Method?
PMM 5.6

Design Bid Build (DBB)

Internal

DB

CM

Acquire Project Team, if required
PMM 6.1

Prepare Consultant Request for Proposal (RFP)
PMM 6.4

Vendor Solicitation
PMM 6.4

Contract Awarded
PMM 6.4

Contract Administration
PMM Appendix E

Report Performance
PMM 7.5,
Templates

Review and Circulate Report for Approval

Approved?

Yes

Revise Project Delivery Plan (PDP) or Business Case (BC)

Phase Gate Approval/ Close Planning Phase
(PMM 8.2)

P2

No

Consultant

Develop Project Delivery Plan
PMM 5.1,
Template

Monitor & Control
PMM 7.0

Report Performance
PMM 7.5,
Templates

Preliminary Design Work

Quality Control (QC) Reviews
PMM 5.5,
Template

Final Milestone Review?

No

Yes

Draft: Preliminary Design Report

Work Process

Procedure

Decision

Document

Data

Start/End

Off- Page Reference

Legend

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Version: 1.0
Status:
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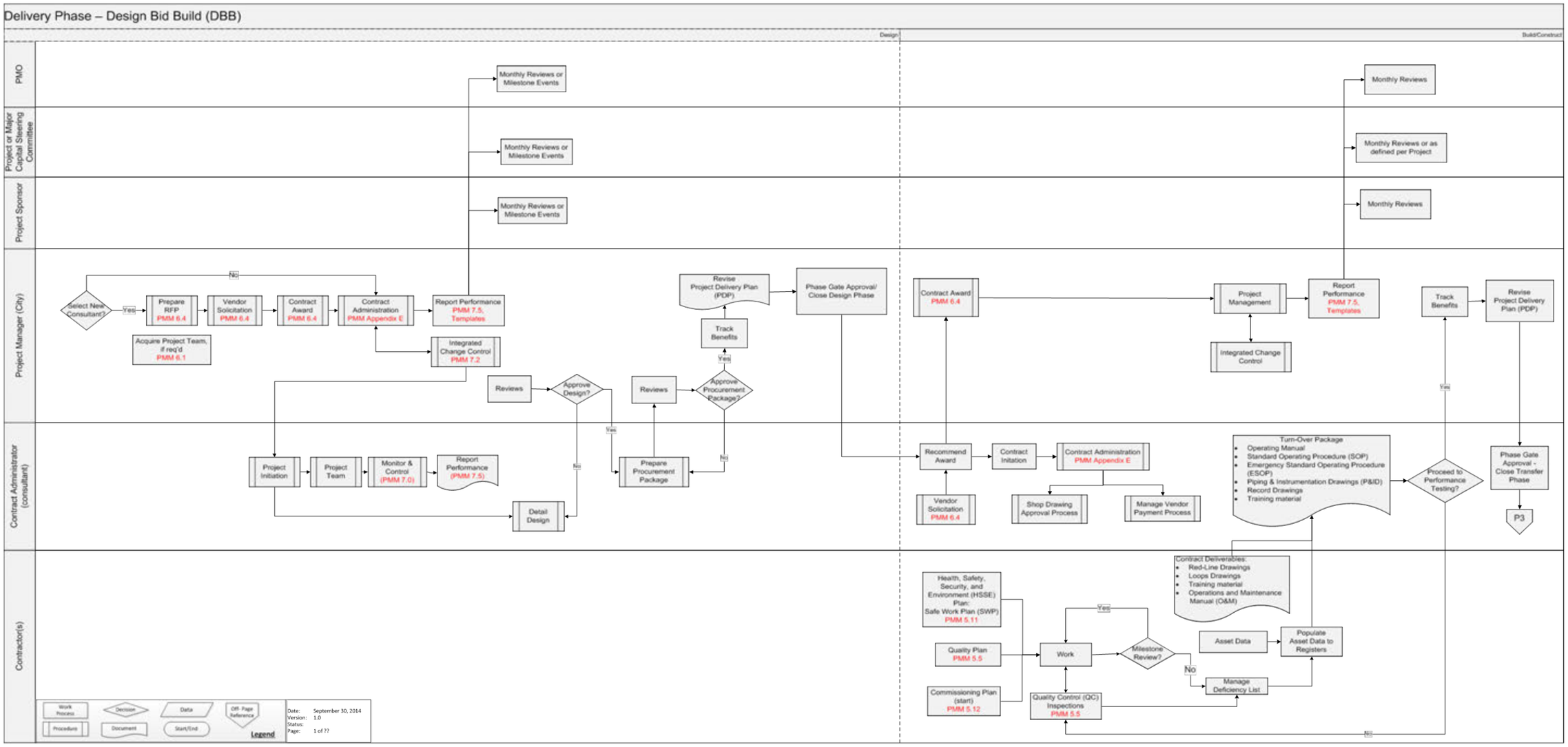
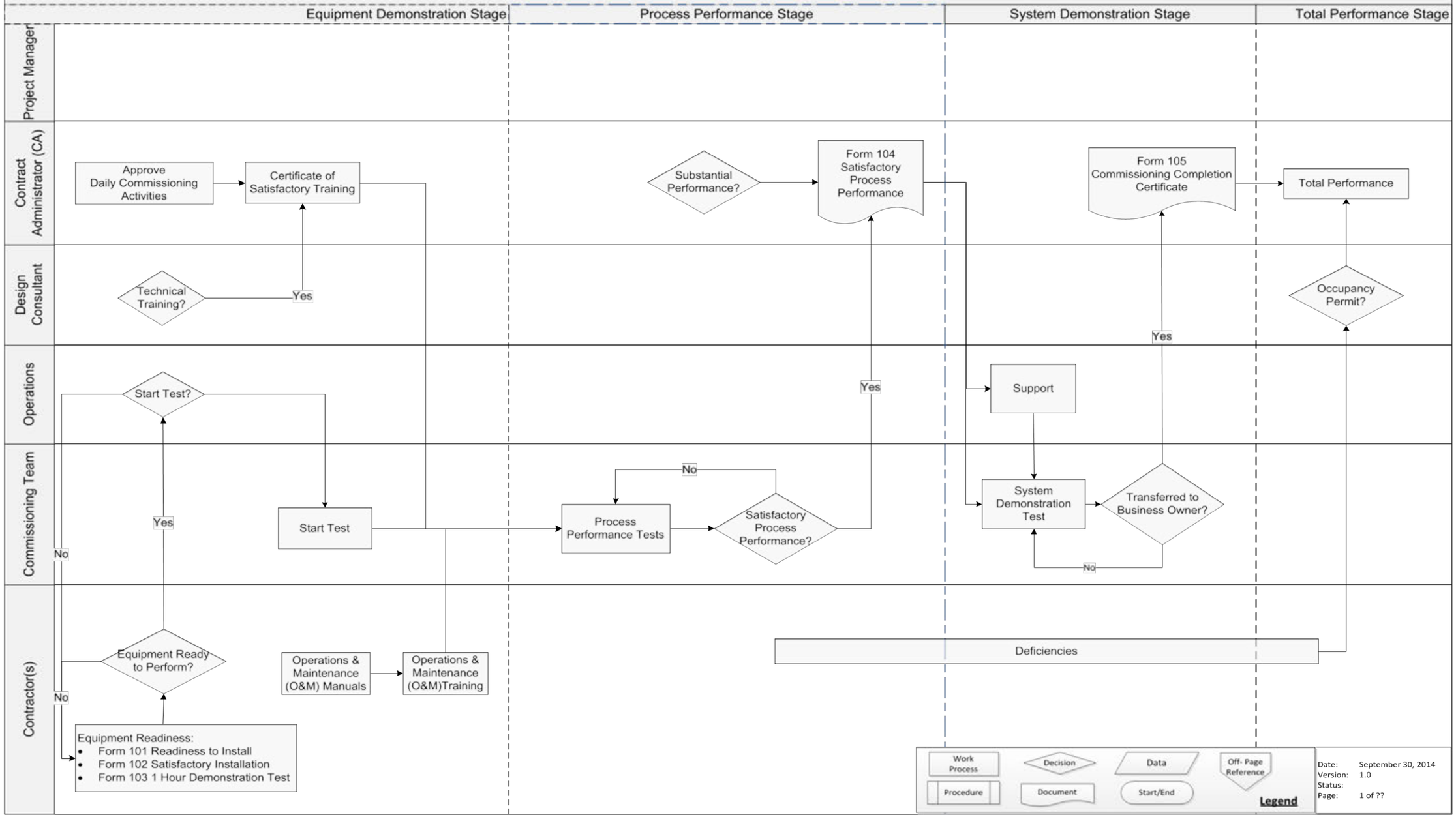
Delivery Phase – Design Bid Build (DBB)



Transfer / Commissioning Phase – Design Bid Build (DBB)



Close-Out Phase – Design Bid Build (DBB)

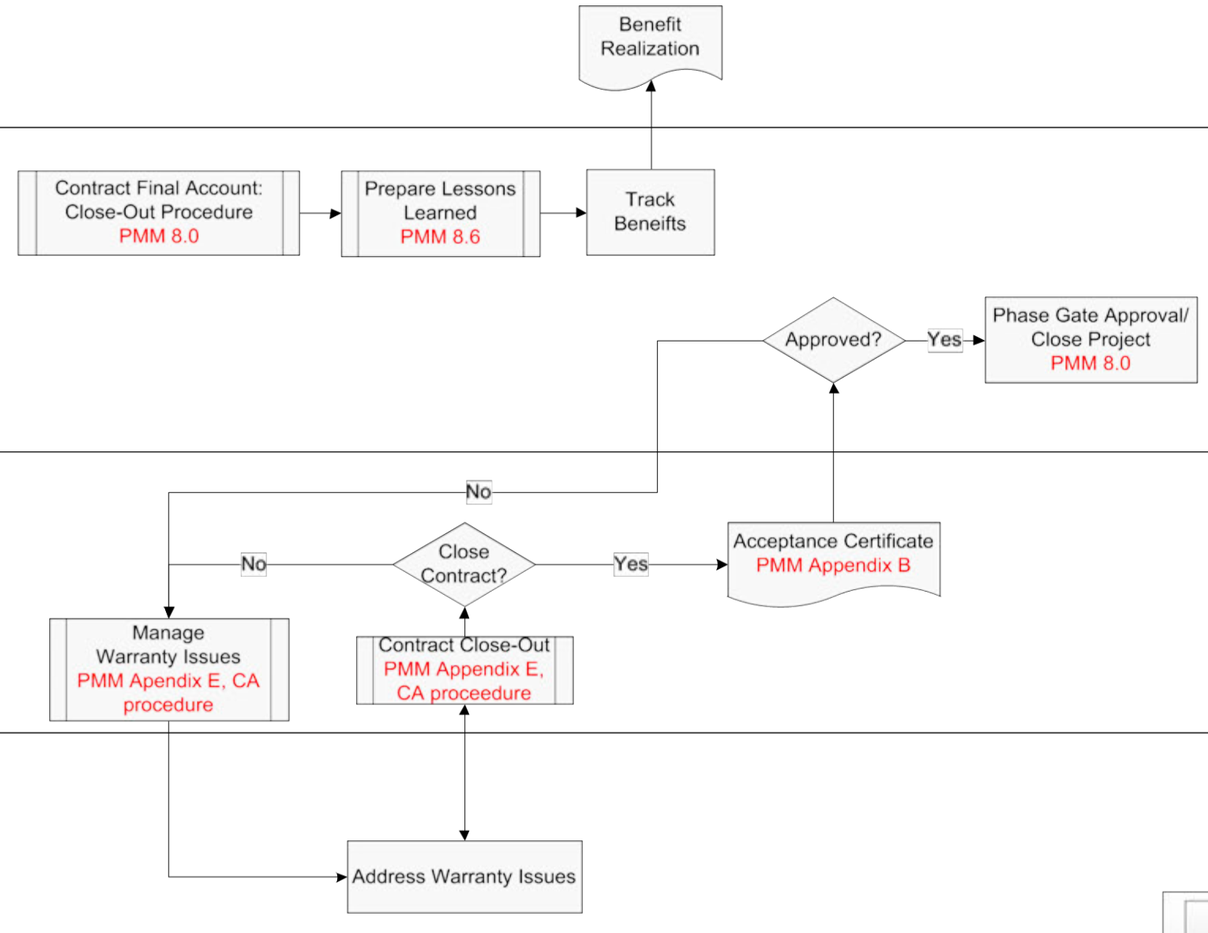
Close-Out Phase

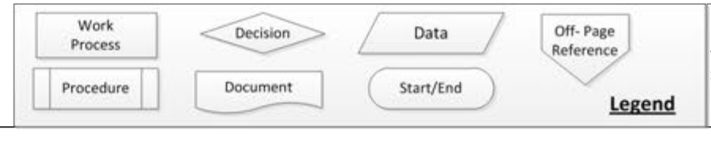
Project Sponsor

Project Manager

Consultant: Contract Administrator

Contractor





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Appendix B
Templates

PMM – Templates

The PMM makes reference to a number of templates as outputs or deliverables from the procedures. The tables below list the templates and identifies where they are referenced in the PMM document. The documents can be found by clicking on the file name or go to the website (under construction).

	Process Group	PMM Reference	Acronym	Description
	Initiating	4.2		Stakeholder and Communication plan
	Initiating	4.3		Project Charter
	Planning	5.1	PDP	Project Delivery Plan
	Planning	5.1		PDP Short Form
	Planning	5.1		PM Checklist
	Planning	5.3	BOE	Basis of Estimate
	Planning	5.7		Project Dashboard Report
	Planning	5.8		Project Status Report
	Planning	5.8		Issue-Decision Log
	Planning	5.8		Council Quarterly Report
	Planning	5.8	PRI	Project Record Index
	Planning	5.9		Project Risk Identification Check-list
	Planning	5.9	RMP	Risk Management Plan
	Planning	5.9	RMP	Risk Management Plan (Short Form)
	Executing	6.2		Team Charter
	Executing	6.4	RFP	Request for Proposal
	Executing	6.4	BO	Bid Opportunity
	Executing	6.4		Summary of Bids
	Executing	6.4		Award Reports
	Executing	6.4		Letters to Bidders
	Controlling	7.2	FWA	Field Work Authorization
	Controlling	7.2	PCN	Proposed Change Notice
	Controlling	7.2	RFI	Request for Information
	Controlling	7.2		RFI Log
	Controlling	7.2		Change Control Log
	Controlling	7.2	ACC	Authorization for Contract Change
	Controlling	7.2	FI	Field Instruction
	Controlling	7.3		Contract OE under $100000
	Closing	8.4		Consultant Performance Evaluation
	Closing	8.6	LL	Lessons Learned
	Executing	Appendix E *	PE	Progress Estimate (mixed tax, HB)
	Executing	Appendix E *		Pre-award meeting minutes
	Executing	Appendix E *		Preconstruction meeting minutes
	Executing	Appendix E *		Criminal Record Search Certificate

	Process Group	PMM Reference	Acronym	Description
	Executing	Appendix E *		Training Session Log
	Executing	Appendix E *		Certificate of Satisfactory Classroom Training
	Executing	Appendix E *		Certificate of Satisfactory Field Training
	Executing	Appendix E *		Certificate of Equipment Delivery
	Executing	Appendix E *		Certificate of Readiness to Install
	Executing	Appendix E *		Certificate of Satisfactory Installation
	Executing	Appendix E *		Certificate of Equipment Satisfactory Performance
	Executing	Appendix E *		Certificate of Satisfactory Process Performance
	Executing	Appendix E *	ITP	Inspection and Test Plan
	Executing	Appendix E *		Inspection Report
	Executing	Appendix E *	DCR	Daily Construction Report
	Executing	Appendix E *	NCR	Non Conformance Report
	Executing	Appendix E *		NCR Log
	Executing	Appendix E *		Plant Entry Permit
	Executing	Appendix E *		Process Interruption Permit
	Executing	Appendix E *		Lockout Tag Out Permit
	Executing	Appendix E *		Hot Work Permit
	Executing	Appendix E *		Confined Space Permit
	Executing	Appendix E *		Critical Lift Permit
	Executing	Appendix E *		Lockout Tag Out Permit
	Executing	Appendix E *		Pressure Test Permit
	Executing	Appendix E *	SP	Substantial Performance
	Executing	Appendix E *	TP	Total Performance
	Executing	Appendix E *		Certificate of Acceptance

***** Contract Administration Procedure

Appendix C
Alternative Project Delivery

TECHNICAL MEMORANDUM CH2MHILL

Alternative Project Delivery: Procurement and Delivery Methodologies Analysis

PREPARED FOR: City of Winnipeg rev1

PREPARED BY: Leofwin Clark/CH2M HILL

DATE: 24 February 2012

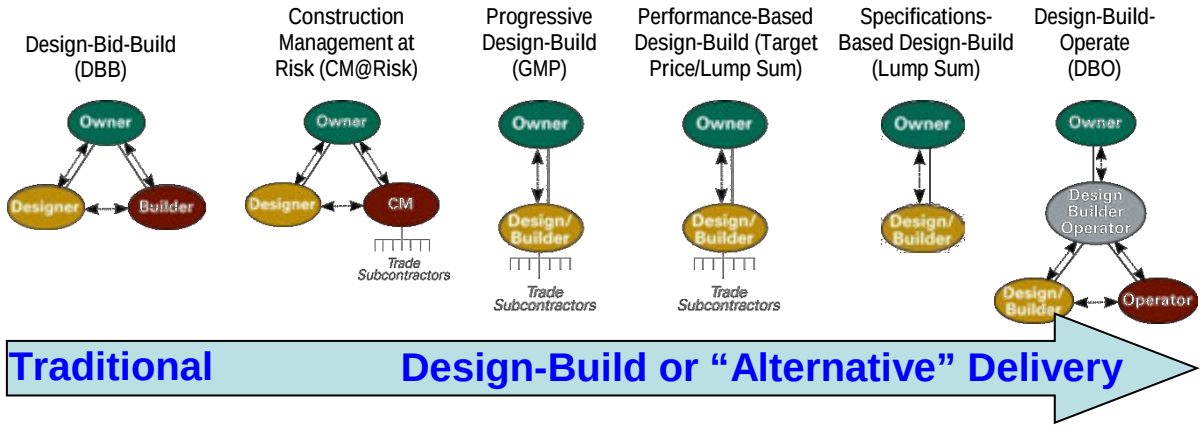
Content - Sections

Implementing an effective project procurement and project delivery system for a complex infrastructure project requires an understanding of a wide spectrum of proven contracting methodologies and accompanying insight to how varying methodologies can align with specific project needs and risk allocations. This Technical Memorandum provides an overview of these procurement and delivery methods and summarizes the strengths, weaknesses, and risk allocation methodology typical of each model. Next, the City of Winnipeg's specific procurement and project objectives are outlined in the context of these procurement options. Finally, a methodology for defining a preferred procurement approach, including several specific contracting mechanisms, is proposed.

The Spectrum of Alternative Project Delivery Methodologies

Procurement methods can take numerous forms, ranging from standard design-bid-build techniques through construction management-at-risk to full at-risk alternative delivery, including many variants of design-build and beyond. This "spectrum" of methodologies is illustrated in Exhibit 1.

Exhibit 1: Project Delivery Spectrum



Moving from left to right on the spectrum, project delivery methods generally evolve from the traditional design-bid-build approach implemented by most public entities until the emergence of a variety of alternative delivery methodologies over the last 15 years. Note that the lines in Exhibit 1 take two forms: direct connections indicate firm *contractual* relationships between the giving entities and arrows represent *collaborative* relationships necessary to make the given model a success. While recognizing that, in practice, there is an almost infinite variation on the specific methodologies and relationships represented by this spectrum, the commonly recognized procurement and delivery models include:

Design-Bid-Build, where an owner contracts separately for engineering and design services that are completed prior to issuing a separate request for bid from contractors. The construction scope is handled by a separate contract directly with the owner and the relationship between engineer and builder is ideally collaborative in the resolution of Requests for Information (RFIs) and verification of compliance with the design.

Construction Management At-Risk, where an intentional overlap is created between the engineer and the contractor, allowing the contractor to bring construction insight to bear as early as practical in the design process. Sometimes referred to as "design-build-light" this methodology maintains two separate contracts, however encourages collaboration during design to reduce risk once the contractor proceeds to construction in the field.

While in conformance to most traditional procurement processes (the engineer is selected using traditional professional services criteria), this method introduces the concept of contractor selection without a hard bid of the construction cost. Instead, contractors are generally selected based on their qualifications in combination with their proposed scope of services and fee for service prior to construction as well as their fee and overhead costs for construction services. The ultimate construction cost is developed during the design period, typically in an open-book fashion, and

ultimately agreed upon as a "guaranteed maximum price" (GMP) prior to authorizing the start of construction.

Where agreement on a GMP cannot be reached or construction pricing competitiveness cannot be verified, owners often maintain the option to convert the construction scope to a hard bid request. In many instances, owners convert GMPs to lump sum pricing.

While promoting collaboration early in the design process, the formal contract vehicles with separate agreements between the Owner and Engineer and the Owner and Contractors are essentially unchanged compared to traditional design-bid-build delivery. During construction delivery, traditional practices for managing contractor change orders, RFIs from the designer, and verification of construction performance remain unchanged.

Design-Build, where the entire project is contracted with a single entity (or a consortium of entities acting together as one entity) with a single-point of responsibility to the owner. In practice, design-build can be procured using a number of different methods, often tailored to meet local procurement regulations and practice as well as to align with project complexity and the level of design completion anticipated to be undertaken prior to the procurement.

The various forms of design-build procurements differ largely in the type of pricing requested of proposers and in the degree of problem definition developed for the project in advance of procurement and subsequently provided to the design-builder in the request for qualifications (RFQ)/request for proposals (RFP). The industry recognizes three basic design-build models as follows:

Progressive design-build. In a progressive design-build procurement, a design-builder is selected based primarily on qualifications and, where local practice requires it, limited pricing information generally similar to the construction management at-risk model with an added component of cost for design services (either in a lump-sum for or on a not-to-exceed basis). As the design-builder develops the design, a construction cost estimate is progressively developed, often in conjunction with the 30- and 60 percent levels of design detail. Once the design is well advanced (beyond 60 percent and often up to 90 percent), a GMP is defined for approval by the owner. (As with Construction Management At-Risk, some owners convert GMPs to lump sum pricing.) If the design-builder and the owner cannot reach agreement on an acceptable GMP or lump sum, the owner can use the completed design as the basis for a hard construction bid procurement.

Progressive procurements are often preferred when a project lacks definition or when an owner prefers to remain involved in the design process while leveraging the schedule, collaboration, and contractual advantages provided by design-build. This model is also valuable when regulatory permitting requires well-developed design solutions, or when an owner believes that they can lower cost by participating in design decisions and in managing risk progressively through the project definition phase.

Owners do not generally use the progressive procurement method when a project's definition is well advanced prior to the procurement or when a lump sum construction price is preferred (or required) to select a design-builder.

Performance-based design-build. In a performance-based design-build procurement, the RFQ/RFP generally includes a conceptual design as a minimum and a 15 percent design as a maximum. Requirements are stated as measurable performance objectives of the

completed project rather than the specific approaches or processes the design-builder should follow to achieve those objectives.

A performance-based procurement gives design-builders' the flexibility to propose how they will meet the owner's objectives while requiring proposers to provide a lump sum price for completion of the project. Alternatively, owners may ask for a "target price" for construction that establishes a not-to-exceed construction price basis, while allowing the owner to collaborate on and adjust scope during detailed design definition. In this case, the "target" lump sum can be adjusted after award, however only as directed via owner-approved scope changes. Except for these explicitly approved owner changes, the design-builder must conform to their originally proposed price.

Performance-based procurements are often preferred when an owner has a clear vision for how a facility must perform, with limited resources, time, interest in the specific method for gaining required performance. This model is used to prompt industry's most innovative and cost-effective solutions through what is essentially a design competition, typically in combination with a need to accelerate schedule.

Prescriptive design-build. In a prescriptive design-build procurement, the RFQ/RFP typically includes at least a 30 percent design completed by an owner's consultant prior to the procurement, often referred to "bridging documents." Requirements are stated in terms of specific approaches or processes the design-builder must follow.

Prescriptive procurements are often preferred when owners are very clear on their preferences and want to use design-build to accelerate the schedule while allowing selection of a design-builder based on a combination of qualifications and a lump sum price. While a design-builder may offer a variation or alternative concept to the bridging documents, procurement procedures are often established to require owner review and approval of these exceptions or "alternative technical concepts" in advance of the proposal submittal. With this method, the lump sum price in the design-builder's proposal is only adjusted for specific owner-initiated scope changes, generally due to unforeseen conditions or a change in law or regulatory practice.

Design-Build-Operate (DBO) and Design-Build-Maintain (DBM), anchors the end of the alternative project delivery spectrum, providing owners with a whole-life solution for project implementation. Typically, DBO/M procurements are developed from the basis of a performance-based design-build model with the added component of requiring the proposer to operate the facility for an extended period of time (typically no less than 5 years and often as long as 15 or 20 years). The operations component ensures that the performance commitments of the design-build proposal are indeed met as the design-build must deliver on them during its tenure – or alter or repair the facility accordingly. Depending on the type of infrastructure, long-term operations can focus on maintenance and repair or replacement of critical components (typical for transportation projects) or on day-to-day operations with permanent staff (as is typical of water/wastewater projects). In either case, DBO/M entities are typically formed by a consortium of designers, builders, and operators, often led by operators as the majority value of DBO/M contracts can often be in the operations scope versus the capital construction.

DBO/M procurement models allow proposers to evaluate true lifecycle costs of a project while requiring them to operate facilities for an extended period of time, transferring risk to the DBO/M entity. Owners typically select this alternative when whole-life (lifecycle) is of greatest concern, often when they do not currently have a fixed operations staff in place for the given facility. Also,

owners prefer DBO contracts when selecting new or unproven technology that requires long-term, hands-on demonstration of performance.

The DBO methodology is less preferred when an owner already maintains an operations staff in place, particularly if their operators work under public union contracts that are administratively or politically difficult to transfer to the private sector.

DBO/M Finance (DBOF or DBMF), models that include financing are most common in context of public-private-partnerships (P3) in Canada. For example, the Canada P3 Infrastructure fund requires a long-term operations component or a finance component to be considered as a qualified P3 infrastructure project (and, in practice, both operations and financing are preferred. In Manitoba, P3 projects general contain both a financing and operations component. For the purposes of this analysis, P3 considerations are generally considered separately from alternative delivery methodology analyses. Conclusions as to applicability of an alternative delivery method are applicable to a project no matter where its ultimate funding is obtained.

As noted, there are numerous variations on all of these primary delivery types. For example, projects with extremely specialized technical needs or with unusual risk profiles, such as tunnelling, often require a hybrid procurement and delivery approach that blends many of the concepts defined here. Given a defined set of common traditional and alternative delivery models, the next step is to define specific project goals and, if necessary, identify specialized project drivers that require the development of a tailored procurement approach.

Goals for Successful Alternative Project Delivery Procurements

Evaluating the benefits of a given procurement and project delivery models rests on the City of Winnipeg's overarching goals and mission. For this analysis, we identified several goals that are essential to defining a successful procurement and follow-on project:

Transparent. All procurement processes, methodologies, and selection criteria must be fair, objective, and transparent to the professional services and construction community. No work should be awarded outside of a well-advertised and fairly administered competitive process.

Cost effective. Any procurement methodology should ensure that the City of Winnipeg is receiving best value for the services and construction they are purchasing. To the extent possible, services should be priced and price should be evaluated as part of the selection methodology. Generally, this goal supports target, GMP, or lump sum pricing when possible, although fee-based pricing may be acceptable if the contracting methodology provides an "off-ramp" for hard-bidding construction work to ensure cost competitiveness.

Objective-Focused. Procurement selection strategies should be based on clearly defined evaluation criteria that mirror project challenges and opportunities for project success. In turn, the evaluation criteria will support overall project success.

Efficient. The cost to the City of Winnipeg for implementing the procurement process should be minimized in favor of using funding to maximize delivery of actual project scope. Similarly, the bidding community's resources should be respected by minimizing to the extent practical the cost to propose on work.

Timely. Duration of procurement processes should be minimized, allowing for sufficient response time from bidders in conjunction with a reasonable amount of time to evaluate proposals without other undue delays. Valuable time should be conserved and made available for execution of project scope.

Inclusive. The overall procurement process should ensure that local subconsultants and subcontractors have equal access to project scope for which they are qualified. Projects should be packaged to ensure wide participation, especially for alternative delivery models which might otherwise preclude local firms from at-risk work.

Compatible. Procurement methodologies must remain consistent with existing Winnipeg statute and procurement policy unless specific changes are approved to accommodate identified benefits of alternative delivery. Required modifications to procurement process and practice should be clearly identified as part of the alternative delivery analysis. Similarly, alternative project delivery options specific to wastewater should be aligned with the City's Strategic Partner concept and accommodation for the Strategic Partner's participation in the determination and implementation of procurement methodology must be accommodated.

Tailored Approach to Alternative Project Delivery

Recognizing that each project has specific needs, each of the goals identified above should be addressed by the City's menu of potential procurement methodologies. Alternative delivery is not applicable or beneficial to all infrastructure projects. However, alternative delivery's potential benefits should be considered on the merits at the outset of most projects with a focus on:

Single-Point Responsibility. The benefits of contracting with a single entity for both design and construction are well understood. The most important is avoidance of finger-pointing. If problems arise, the designer cannot blame the builder for not adhering to the design, and the builder cannot blame the designer for a faulty design. With the designer and builder working together from the outset, constructability problems are less likely to arise, and if they do arise, the owner can hold the design-builder responsible for dealing with the problems. In contrast, the arms-length relationship between the designer and the builder in a design-bid-build procurement effectively puts ultimate responsibility for the design on the owner.

Value-Based Selection. In public infrastructure procurements, many owners prefer to select based on some form of detailed pricing to protect rate- or taxpayer interests. However for design-build procurements, factors in addition to price can be considered when awarding a contract – factors such as prior experience with similar projects, innovative ideas for meeting project objectives, overall lifecycle costs, and ability and willingness to work as a team with your staff.

Time Savings. Design-build delivery has proven to be particularly effective for water and wastewater projects with strict schedule constraints because construction often begins before the design is completed.

Early Understanding of Total Project Costs. Alternative delivery infrastructure projects are typically priced using a GMP or lump sum approach. The quoted price includes design and construction. This price is arrived either at the initiation of the project or at an early stage of the design effort. This avoids the potential problem in design-bid-build projects of a design that is only constructible at a prohibitive cost.

Based on these recognized advantages of each common delivery method as shown in Exhibit 2 (next page), there is a clear value in *considering* alternative project delivery for a given project.

Exhibit 3: Advantages and Disadvantages of Procurement and Alternative Project Delivery Methodologies

Methodology	Advantages to Owner	Disadvantages to Owner
Design-Bid-Build	Well understood and time-tested process and procedures. Ability to select sub consultants by qualifications and cost in the traditional manner. Limited at-risk exposure to local professional firms. Bids to full plans and specifications. Full going-in construction price known at bid time.	Linear process takes time. Little or no designer/contractor collaboration. Limited job size/scope may not attract best potential technologies/best practices. Relies on engineer's estimates until very late in the project. Hard bids subject to design omissions and resulting change orders. Little opportunity to select contractor on qualifications and past performance in addition to price. Separate contracts for design and construction creates multiple points of contact for owner and does not align business interests.
Construction Management At-Risk	Relies on proven, accepted method for selecting professional engineering services based on qualifications/price. Integrates constructability earlier in the design process. Provides contractor-led estimates earlier and allows scope revision during design to meet project budget. Can reduce overall project risk and contingency. Can reduce design misunderstandings and resulting potential for change orders. Allows qualifications and past performance to be taken into account when selecting a contractor.	Still relies on engineer's estimate for initial cost characterization. Creates a "forced marriage" between designer and contractor that may – or may not – work. Final construction scope still subject to change order potential. Added cost to owner for contractors pre-construction phase services (although may be offset with construction savings due to early collaboration). Requires selection of contractor based on fees without knowing full construction price. Separate contracts for design and construction creates multiple points of contact for owner and does not align business interests.
Progressive Design-Build with GMP	Maximum control over project design, construction, and O&M costs because final contract is not signed until a large portion of the design is complete Single straightforward and inexpensive procurement process can be completed in short timeframe. Increased marketplace interest due to relatively low proposal preparation cost. Allows selection of designer and contractor based on past performance, qualifications, and ability to work as a single-entity team with aligned interests for project success. Provides progressively accurate, contractor's estimates of total project costs from earliest point in project through GMP definition. Provides maximum opportunity for designer, contractor, and owner collaboration to define scope, meet schedule and budget, and tailor	Requires selection based on fee, full construction cost is not known at the time of initial contract. Existing project design investment may not be of value or use to design-builder. May not be as fast to deliver as other design-build methods due to potential for extended design/estimate development period, including involvement of numerous stakeholders in the design process. May not be perceived as being "competitive" for construction pricing. Requires significant owner staff involvement and resources during design. May limit local/small sub consultant participation due to at-risk nature of the work.

Methodology	Advantages to Owner	Disadvantages to Owner
	subcontracting plan. Provides an “off-ramp” to hard-bid construction if GMP is not competitive or cannot be agreed upon. No contractor-initiated change orders. Requires little or no design to be completed by owner in advance of procurement. Single contract and point of contact with owner.	
Performance-Based Design-Build with Target Price or Lump Sum	Maximum potential for design-build cost savings through design innovation during competitive procurement. Maximum transfer of design-related performance risk to design-builder. Minimal design work by owner required prior to procurement, resulting in relatively low cost to prepare RFP. Fastest possible procurement and project delivery schedule. Perceived as “competitive” construction pricing, providing full contract cost at bid time. Allows selection of designer and contractor based on past performance, qualifications, and ability to work as a single-entity team with aligned interests for project success. No contractor-initiated change orders. Single contract and point of contact with owner.	If lifecycle cost is not analyzed or operations not included in scope, may result in higher O&M costs or undesirable project features. Proposal evaluation and selection is relatively complex. Limited ability to predict what will ultimately be proposed. Lump sum pricing may include excess risk and contingency cost due to undefined project scope. Limited opportunity for owner and design-builder collaboration on design during procurement process. Limited ability for owner to adjust proposed design, scope without resulting in owner-initiated change orders and resulting price adjustments. May limit local/small sub consultant participation due to at-risk nature of the work.
Prescriptive-Based Design-Build with Lump Sum	Substantial control over project design and O&M costs. Proposal selection can emphasize project design-build cost. Allows selection of designer and contractor based on past performance, qualifications, and ability to work as a single-entity team with aligned interests for project success. Perceived as very “competitive” construction pricing, providing full contract cost at bid time. High level of project definition when the design-build contract is signed. No contractor-initiated change orders. Single contract and point of contact with owner.	Procurement schedule is prolonged and RFP preparation is costly due to high level of design required to be developed by owner prior to procurement. Design risk not clearly assumed by the design-builder. Very complex and staff intensive evaluation of proposals. Does not promote as much innovation, or results in design-builder “alternative” proposals requiring additional evaluation. Limited opportunity for owner and design-builder collaboration on design during procurement process. Limited ability for owner to adjust proposed design, scope without resulting in owner-initiated change orders and resulting price adjustments. May limit local/small sub consultant participation due to at-risk nature of the work.

Design-Build-Operate	Opportunity to include long-term operations and lifecycle cost. Provides for numerous turn-key delivery options. May provide method for obtaining project financing not otherwise possible.	Requires long-term commitment to contract mechanism and future payments. Can be complex to implement and controversial. May encounter public employee union resistance.

Appendix D
Glossary

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
***A Guide to the Project Management Body of Knowledge*, Fourth Edition**	PMBOK Guide	A set of standard terminology and guidelines for project management published by the **Project Management Institute**, providing a general guide to managing most projects most of the time.	
ADKAR	ADKAR	▪ Prosci's ADKAR Model is an individual change management model. It outlines the five building blocks of successful change, whether that change occurs at home, in the community or at work. The name "ADKAR" is an acronym based on the five building blocks: ▪ **A Awareness** of the need for change ▪ **D Desire** to participate and support the change ▪ **K Knowledge** on how to change ▪ **A Ability** to implement required skills and behaviors ▪ **R Reinforcement** to sustain the change.	
Advisory Committee		A group of stakeholders that works at the request of the project manager and uses consensus to provide advice, options, and recommendations to help the Project Sponsor and Project Manager make decisions.	
Alternative project delivery	APD	Methods of delivery that are not design-bid-build. Alternative methods include design-build, variations of design-build, construction management, and P3. The Project Management Manual has additional requirements for assessing P3s, and treats them differently in this regard.	
As-constructed drawings		The result of revising construction drawings such that the details on the drawings represent what and how the final product was constructed. The two types of as-constructed drawings are: 1) Drawings represent exactly how the project was constructed (e.g., underground works) and are stamped by an engineer. 2) Drawings are produced by the contractor and not stamped by an engineer.	
Asset (facility) strategic plan		A plan that outlines how an asset group or a specific asset will meet the needs of an organization based on the organization's strategic plan or other internal or external force. The view is long term, meeting the organization's strategic vision and the life cycle of the specific asset.	
Asset Management - Management System	AMMS	A set of interrelated or interacting elements that establish policies and objectives on how Assets are to be managed. These elements include governance (policy & administrative standards), processes and technology that work together to achieve those objectives.	
Asset management plan		A tactical plan for managing infrastructure assets to deliver an agreed level of service at an acceptable level of risk.	
Asset risk		Asset risk relates to the consequences and likelihood of asset failure on the delivery of service	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Association for the Advancement of Cost Engineering International	AACE	Non-profit association that provides its members resources to enhance their performance, and provides certification in cost management disciplines, including cost engineering, cost estimating, planning and scheduling, decision and risk management, project management, project control, cost/schedule control, earned value management, claims, and more.	
Association of Professional Engineers and Geoscientists of the Province of Manitoba	APEGM	Professional association that governs and regulates the practice of professional engineering and professional geoscience in the Province of Manitoba.	
Basis of Estimate	BOE	A document that defines the scope of the project, and ultimately becomes the basis in the change control process.. When prepared correctly, any person with capital project experience can use the BOE to understand and assess the estimate, independent of any other supporting documentation. A well-written BOE achieves those goals by clearly and concisely stating the purpose of the estimate being prepared (i.e. cost study, project options, funding, etc.), the project scope, pricing basis, allowances, assumptions, exclusions, cost risks and opportunities, and any deviations from standard practices. In addition the BOE is a documented record of pertinent communications that have occurred and agreements that have been made between the estimator and other project stakeholders.	
Bottom-up estimating		Approximating the size (duration and cost) and risk of a project (or phase) by breaking it down into its smallest work components; estimating the effort, duration, and cost of each component; and aggregating them into a full estimate.	
British Standards Institution	BSI	Multinational business services provider whose principal activity is producing standards and supplying standards-related services.	
Business Case	BC	A document that identifies valid Needs, verified through the Needs Assessment process. They are meant to serve as a consolidated information source for each investment, documenting needs, evaluating options, identifying influencers and constraints, and defining the solution. See the IP manual for further details.	
Business Owner		The entity in the project organizational structure that accepts receipt (ownership) of the final product or service (deliverables). Can be the control & use owner on most projects. Equivalent to the client role in a consultant delivered project. See the section 5.6 in the PMM for detailed Responsibilities and Authorities attached to this role.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Business Unit	BU	An organization term that is used to define the specific level or business area within the City organization. Can be used to define a Department, Division or Branch level.	
Canadian Registered Safety Professional	CRSP	A organization of safety professional in Canada	
capital budget expenditures	Capex	An expenditure incurred against a capital account for fixed assets or to add to the value of an existing fixed asset.	
Capital investment plan	CIP	A plan that provides a detailed understanding of anticipated investments into tangible capital assets, over multiple years.	
Certificate of Recognition	COR™	The (COR™) is an occupational health and safety accreditation program that verifies a fully implemented safety & health program which meets national standards	
Challenge session		A process by which business cases are vetted through, where they are scrutinized by a panel of business unit and Department managers to ensure they provide a comprehensive view and justification for the required investment.	
Change control process		A formal process that ensures changes to a project, product, system, or approach are introduced in a controlled and coordinated manner. Effective project change control processes allow the proper focus to be maintained to complete projects on time and within budget. It properly integrates or postpones requests for changes to the project's scope that may result in revisions to the project's budget and completion schedule. Change control processes provide an efficient and effective method of change control within a project management framework.	
Change management		A formal process to manage change to how people work within an organization. This change is created with the initiation of a project.	
Change Manager	CHM	The City of Winnipeg has certified change managers located in every department who form a Change Management Working Group sponsored by the CAO. Project managers should know who their departmental change managers are and should consult with them during the Initiation Phase of all projects. For a list of departmental change managers, refer to the distribution list in MS Outlook, CITY-ADKAR-Change-Managers, or contact the Manager, City Asset Management Program.	
Change of scope		A request to change the agreed scope and objectives of the project to accommodate a need not originally defined to be part of the project.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Change Order	CO	A document within the change management process required to change a baseline control document, planning or design document, contract, or specification. Once a revision notice has been signed by the owner, contractor, and consultant, the change can be implemented. The change Order template is designated as "Authorization for Contract Change"	
Chief Administrative Officer	CAO	City of Winnipeg employee holding the position of Chief Administrative Officer	
Chief Financial Officer	CFO	City of Winnipeg employee holding the position of Chief Financial Officer	
City's General Insurance		The City's General Insurance includes the following: • All risk property insurance • Automobile liability coverage (city vehicles) • Workers compensation coverage • General liability insurance	
Commissioning		The sequence of activities required for a project to become fully operational (intended purpose) and meet the output specifications provided in the performance testing and commissioning plan. On some in-house projects, may be also known as "Go Live".	
Commissioning Completion Certificate		The certificate issued by an architect or engineer designated by the project manager and approved by the sponsor and/or owner confirming that the project has met the commissioning requirements provided in the performance testing and commissioning plan.	
Comprehensive General Liability	CGL	An insurance policy that provides protection from third-party claims of bodily injury or property damage that allegedly arise as a result of the contractor's operations or work on the construction project from persons not associated with the project.	
Conceptual design		A design effort that establishes basic processes, rates, sizes, configurations, and levels of technology. Questions relative to obtaining permits and approvals are addressed. Drawings produced at this level of effort are not used for construction or purchasing. Cost estimates range from approximately 30 percent below to 30 percent above the final construction cost of the facilities defined, not considering inflation. A schedule prepared during conceptual design should show general activities only, preferably in bar-chart form, and any critical path would only be inferred, not stated to any detail. The final product of conceptual design is a report containing the consultant's recommendation supplemented by drawings, cost estimates, schedule, and an approach to obtaining permits and approvals.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Construction cost estimate		An estimate of the initial capital cost of a constructed facility, not including projected operations and maintenance costs. This forms part of the BOE.	
Construction Manager	CM	The role of the individual in a specific project delivery method. This individual is responsible to construct the product. The role will involve managing many contract and coordinating resources to meet their contractual requirements The construction manager service can be provided as “pay for service” or “at risk”. At risk, the construct manager is committed to delivering a specific project at a defined cost and time and can face financial penalties if not delivered.	
Construction Review Record	CRR	A document used to capture the findings of a construction inspection	
Consultant		Vendor contracted by the City to provide engineering or other specialist services for a project	
Contract Administrator	CA	The individual whose role is identified in a contract with specific responsibilities and authority.	
Contractor		Vendor contracted by the City to provide goods and services, including construction contracts	
Control & Use Owner		Responsible for ownership of the asset on the City’s behalf. Typically accepts the final project product or service. See the section 5.6 in the PMM for detailed Responsibilities and Authorities attached to this role.	
Critical Path Method	CPM	A critical path is the sequence of project activities which add up to the longest overall duration. This determines the shortest time possible to complete the project. Any delay of an activity on the critical path directly impacts the planned project completion date (i.e. there is no float on the critical path). A project can have several, parallel, near critical paths. An additional parallel path through the network with the total durations shorter than the critical path is called a sub-critical or non-critical path	
Daily Construction Report	DCR	A template that is used to record the daily events on a construction site	
Design Build	DB	A project delivery method where the vendor is contracted to design the product and also build the facility to the requirements identified and approved by the owner	
Design-Bid-Build	DBB	The traditional approach for project delivery where separate entities provide services for the design and construction of a project.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Design-Build-Maintain	DBO/M	A procurement delivery method, where a vendor is retained to prepare the design, construct the product and maintain the finished product but not operate the facility. I.e. build a community centre and maintain the facility but not have staff operating the facility.	
Design-Build-Operate	DBO	A procurement delivery method, where a vendor is retained to prepare the design, constructs and operates the finished product.	
Detailed design		A design effort that includes the preparation of construction drawings and specifications; procurement of all equipment, materials, and construction services; and development of pre-bid estimates and construction schedules. Drawings produced are sealed, dated, and issued for construction. Cost estimates are used for monitoring construction expenditures and should be within 10 percent of the final construction costs. The critical path schedule prepared during preliminary design is updated to reflect design and construction progress. The final product is a complete package of construction drawings and specifications and firm prices obtained for engineered equipment, materials, and construction services in accordance with the cost estimate and schedule.	
Direct costs		A price that can be completely attributed to the production of specific product or service. Direct costs refer to materials, labor and expenses related to the production of a product.	
Earned Value Management	EVM	A management technique used for project delivery for integrating and reporting on scope, schedule, and resources.	
Emergency Standard Operating Procedure	ESOP	Procedures developed in advance of a defined emergency event that is used when that emergency event occurs. Operating in an environment that is not standard way of operating a facility or service due to an unplanned event.	
Environment Act		The Environment Act is intended “to develop and maintain an environmental management system in Manitoba which will ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for this and future generations.” Administered by the Department of Conservation, the Act is used to assess, regulate, and control discharges to the environment. The primary mechanism for achieving this action is through the licensing of developments under the provisions of the Act. The Classes of Development Regulation 164/88 provides the specific undertakings that are considered to be developments under the Act.	
Errors and omissions	E & O	A term used in the insurance industry for fault in professional services in which a mistake is made by not doing something that should have been done, or not including something that should have been included.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Estimate at Completion	EAC	An estimate of the projected financial status at project completion.	
Estimated costs		The forecasted cost of a project or deliverable.	
Executive Policy Committee	EPC	The Executive Policy Committee is comprised of: • the Mayor • the Chairpersons of the Standing Committees • any other members of Council appointed by the Mayor The general duties of the Executive Policy Committee include: • formulating and presenting recommendations to Council respecting policies, plans, budgets, by-laws and other matters that affect the city as a whole • ensuring the implementation of policies adopted by Council	
Facilities		Building assets that provide a service to the Public or the Public Service.	
Factory acceptance testing	FAT	Pre-defined test that the supplier (factory) of a piece of equipment is required to perform before that piece of equipment is transported to the job site. Purpose is to ensure QA/QC on the equipment prior to transport.	
Field instruction	FI	Written instructions that direct the contractor to take a specific action. The formal change order process should be followed concurrently to obtain required approvals and link up with the FI.	
Field Work Authorization	FWA	Written direction provided by the CA authorizing the contractor to proceed with specific tasks. Typically are only done when time is of the essence and there needs to be a formal written direction given.	
Financial reporting standards		Accounting principles generally accepted in Canada as recommended in the Handbook of the Canadian Institute of Chartered Accountants (GAAP), American Financial Accounting Standards Board (FASB) standards, or International Financial Reporting Standards (IFRS), as applicable, or as may be amended or replaced.	
Freedom of Information and Protection of Privacy Act	FIPPA	An act that defines the rules for what and how information can be shared when requested	
General conditions	GCs	Boiler plate clauses that apply generically to all similar types of work. GCs for City of Winnipeg Consultant Services and Bid Opportunities are published and updated on the City's website.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Guaranteed maximum price	GMP	Form of contract where the contractor provides a guarantee to the Owner that the product or service will be completed at a maximum price. The scope of the product or service is very defined, with specific risks assigned to the Owner and the contractor based on their ability to control.	
HSSE	Health, Safety, Security and Environment	Health, Safety, Security and Environment	
Implementation phase or Construction phase		The phase that commences immediately following the completion of the preliminary design phase and ends on the commissioning completion date of the capital project.	
Inspection and Test Plan	ITP	A QA/QC plan that outlines the specific test that will be conducted to verify quality. Plan also includes the other key elements as in any plan: who, what, when where and why.	
International Organization for Standardization	ISO	An international standard-setting body composed of representatives from various national standards organizations that promotes worldwide proprietary, industrial, and commercial standards.	
Intervention		An intentional effort, either in the form of a capital project or a change in operational practice, required when an asset is at risk of service delivery failure, an enhanced level of service is required, additional demand needs to be accommodated, or new legislative requirements need to be met.	
Issue		Disagreement among any parties including controversy, conflict, claim, disagreement, or difference of opinion that requires resolution. An issue must be entered into the issue register and resolved via a formal process once the issue has been identified as unresolvable by the initial originating parties.	
Letter of Intent	LOI	A formal document that is issued to the vendor selected via the procurement solicitation process. The letter states the intent of the Owner to enter into a formal contract. The letter provide legal authorization for the vendor to proceed while the formal contractor is prepared for signature	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Level of service	LOS	Level of service is a qualitative measure used to describe the operating condition of a particular asset from a customer/user perspective. Levels of service can be grouped into three separate categories: - **Essential Level of Service**: Aspects of service required by existing legislation/regulation or with regard to public health, such as Health and Safety, Environmental Protection, or Hazardous Materials. - **Quality Level of Service**: Aspects of service that are discretionary to the City or business unit but affects the quality of life and experience of citizens and users, such as the availability of primary amenities, reliability of building components, etc. **- Image Level of Service**: Aspects of service which maintain image or appearance, such as the availability of secondary amenities, or the visual appeal of landscaping, finishes, etc.	
Life-cycle costing	LCC	A technique that establishes the total cost of an asset, or its part throughout its cycle life, while fulfilling performance requirements**.** **See "whole-life costing" for explanation of difference between whole-life costing and life-cycle costing.**	
Likelihood		When performing a risk assessment, likelihood relates to the probability or frequency of the failure occurring within a planning horizon, and is often represented by the estimated return period or remaining life of the asset.	
Materials Management Policy	Policy	Policy that governs the materials management functions and most types of procurement for the City of Winnipeg.	
Microsoft Project	MS Project	Scheduling software provided by Microsoft Corporation.	
Monte Carlo Simulation Method	MCS	Is a more sophisticated quantitative technique for analyzing risk and quantifying the contingency value. As with the three-point range estimate, the output of MCS is a probability distribution for total cost of the project.	
Multi Criteria Prioritization	MCP	An approach to evaluate and rank projects contribution to a range of service and business priorities, to allow for the development of the best-value Investment Plan for a given level of funding.	
Net Present Value	NPV	The total present value of a time series of cash flows. NPV is a standard method for using the time value of money to appraise projects.	
Non Conformance Report	NCR	A formal report to the contractor that details what specific element do not conform with the contract design specification	
Operating expense	OPEX	A category of expenditure that a business incurs as a result of performing its normal business operations.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Operation and maintenance manuals	O&M Manuals	Manuals that provide concise descriptions, technical details, operating and maintenance instructions and schedules, commissioning records, log books, catalogues, principles of operation, method of operation, and other information that will enable the ongoing operation and maintenance of the plant and equipment. The comprehensive descriptions are accompanied by diagrams and other illustrations to facilitate knowledge and understanding about the operation of the plant and equipment. Examples include hydraulic flow diagrams, electric wiring diagrams, electronic circuit plans, and mechanical air flow diagrams.	
Operations and maintenance		Work and services necessary to operate and maintain project facilities.	
Over expenditure		**Contract over expenditure**: the accumulated expenditure approved exceeds the purchase order amount (contract award amount) for that specific contract. **Budget over expenditure**: the accumulated expenditure for a specific budget line item exceeds the cumulative amount of approved budget for that specific project.	
Partnering		Exercise designed to create a positive, dispute-prevention atmosphere during contract performance. Partnering uses team-building activities to define common goals, improve communication, and foster a problem-solving attitude among individuals who will work together throughout the contract. A central objective of partnering is to encourage contracting parties to change from their adversarial relationships to a cooperative, team-based approach to prevent disputes. Partnering is not about relaxing the contract terms or circumventing the processes, it is not about expecting service providers to do extra work for free, it is not simply about dispute resolution. It is about realizing that time is money, and partnering does mean that if parties can each get what they want out of a situation, by each doing things in a slightly different way, we all win.	
Performance testing and commissioning plan		A plan that demonstrates a project can be readily and reliably operated to achieve the predetermined specifications.	
Performance verification tests		The testing of systems and subsystems of a project and the entire project to confirm that the project meets or exceeds the performance requirements stipulated in the specifications.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Portfolio/Program/Project Management Office	PMO	An entity within an organization that is used to manage investments either at the portfolio or program or project level. Each level addresses a specific business need within an organization. • Portfolio – Doing the right Investment. Ensuring the investments meet strategic needs. Providing governance and training across the organization. • Program – Managing a major program initiative. Ensure resources are directed to achieve the benefits identified in the business case. • Project – Ensuring the investment is done right. Providing support to the PM and ensuring the processes and procedures are followed	
Preliminary design		A design effort that establishes general arrangements, site plans, and floor plans; specifies and selects major engineered equipment; defines design criteria; and initiates the permit approval process. Drawings and specifications produced at this level are considered permanent. Final project documents when completed are used for major engineered equipment purchasing and general site pioneering and layout. Drawings should be sealed and dated. Cost estimates prepared during this phase should range from 20 percent below to 20 percent above the final construction cost of the facilities and include preliminary prices for engineered equipment obtained from manufacturers. Schedules prepared during this phase make be in the form of a network, and critical paths may be developed. The final product of preliminary design is a report containing design criteria, drawings, major engineered specifications, a critical path schedule of activities including construction and procurement, and applications for obtaining permits and approvals.	
Preliminary design phase		A sub-phase of the project planning phase, usually included on complex projects prior to detailed design.	
Process and Instrumentation Diagrams	P&IDs	An engineering drawing that shows the interconnection of process equipment and the instrumentation used to control the process.	
Procurement plan		The documented defining of the steps and approach for how and when procurement will take place.	
Program		A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually.	
Program plan		A document defining a program's benefits and how those benefits will be realized.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Progress estimate	PE	The PE is the formal document that identifies what items on the contract the contractor will be paid for. The PE is signed off by the contractor and CA prior to processing.	
Project		A temporary endeavor undertaken to create a unique product, service, or result.	
Project Charter		A document issued by the sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.	
Project Delivery Plan	PDP	A document defining how the project will be executed, monitored, and controlled. The City of Winnipeg's PDP is defined in the Project Management Manual.	
Project Execution Plan	PXP	Documents defining how a consultant will execute, monitor, and control a project, similar in content to a project delivery plan.	
Project Management Institute	PMI	Non-profit organization with globally recognized standards, providing advocacy for a project management and certification program for members.	
Project Management Manual	PMM	The document prepared by the City of Winnipeg that provides a standard approach for delivering capital projects.	
Project Manager	PM	City of Winnipeg employee assigned the responsibility for managing a project.	
Project plan		A formal, approved document that outlines how the project manager will deliver the project as defined in the project charter. The project plan references and uses the tools within the IMS for both project execution and project control. The primary goal of the project plan is to obtain approval for how the project will be delivered and managed.	
Project Quality Management Plan	PQMP	The project quality management plan documents the quality requirements for the project and product, and how the project will achieve compliance.	
Project Record Index	PRI	A record that tracks all issue identified by the project manager and the ID number that is generated is used to track this event form birth to grave.	
Project Schedule		The planned dates, durations, and sequencing for delivering the project, usually defined in terms of tasks and deliverables.	
Projects IN Controlled Environments 2	PRINCE2	A project management methodology developed by the government of the United Kingdom	
Proposed change notice	PCN	A document that is forwarded to the contractor or others wherein the proposed change in the work is outlined and pricing for the change is requested.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Public Engagement		On major projects that may have significant and/or long-term impacts socially, economically, or aesthetically, a platform for public consultation and input during the design process may be required or desirable. If the Clean Environment Commission determines that a public review hearing is required in advance of a project proceeding, the first step of this process is an advertisement in the newspaper regarding the proposed hearing for the project that invites public response. Based upon the amount and nature of the response, a decision will be made regarding the need for a public hearing. If the hearing proceeds, the public has an opportunity to make representations regarding the proposed project. Another way by which public consultation may be required or mandated is through the Community Committee or City Council responding to public pressure. During the design process, public engagement may be advantageous to provide the public with proper project information and to receive feedback from the public In recent times, there has been an increased usage of public relations consultants to assist the City and project consultants with the preparation and delivery of a clear, concise, and comprehensive message regarding the proposed project. Another opportunity for public engagement is official opening ceremonies for completed major projects. These official openings commemorate the completion of the project and recognize the efforts of the City in completing the projects for the benefit of the public.	
Publicly available specification	PAS	Organization is called PAS55. Optimal management of physical assets was a Publicly Available Specification published by the British Standards Institution. It has been superseded by ISO 55000 series of Asset Management standards.[1][2] This PAS gives guidance and a 28-point requirements checklist of good practices in physical asset management	
Public-Private-Partnership	P3	A public-private partnership (P3 or PPP) is an alternative approach for project delivery where the private sector assumes a major share of the risks and responsibilities in terms of financing, operating, and maintaining public infrastructure.	
Purchase Order	PO	A contractually binding document that sets out the details, prices, and terms and conditions of a purchase.	
Quality assurance	QA	The process of reviewing and auditing the project as a whole or in part for fitness of use in terms of quality standards. QA makes sure the right things are being done, and in the right way.	
Quality control	QC	The process of monitoring, evaluating, and inspecting actions, results, and products during their execution. QC makes sure the results of what is being done are what is expected.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Request for Information	RFI	A formal document used to communicate a request to clarify or more clearly identify requirements of a specific baseline document.	
Request for Proposals	RFP	Formal request for vendors to provide a service, product, or result in accordance with the way it is defined in the RFP.	
Request for Qualifications	RFQ	A formal procurement process where proponents are requested to submit their qualification for a specific project. The qualification is then analyzed against pre-determined requirements. Those proponents meeting the qualification standard can bid on the next stage in the procurement process.	
Risk assessment		The determination of the quantitative or qualitative value of risk related to a recognized threat (also called a hazard).	
Risk management		A systematic approach to setting the best course of action under uncertainty by identifying, assessing, understanding, acting on, and communicating risk issues.	
Risk Management Plan	RMP	A document describing how project risk management will be structured and performed on the project.	
Risk Register		The record of risk events identified and assessed and actions developed to address those risk events.	
Safety plan		A plan that is details how safety requirement will be implemented on a work site. The goal is to think about safety in advance of doing any activities in order to prevent accidents. The plan also outlines responsibilities and general response procedures in case an incident does occur.	
Small Employer Certificate of Recognition	SECOR(TM)	COR™ for small employers	
Sponsor		The Project Sponsor authorizes use of resources for the project, approves major deliverables, and signs off on each project phase. Individual within the business unit that is responsible to deliver the project and assign the project manager	
Standard deviation	SD	In statistics and probability theory, the standard deviation (SD) (represented by the Greek letter sigma, σ) measures the amount of variation or dispersion from the average. A low standard deviation indicates that the data points tend to be very close to the mean (also called expected value); a high standard deviation indicates that the data points are spread out over a large range of values.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Standard Operating Procedure	SOP	The procedure documents the steps for how an individual or group of individuals are to operate a facility, piece of equipment or system. The procedure ensure consistency and is a QA process document	
Steering Committee		A group of high-level stakeholders who provide guidance on the overall direction of the project or the business. Steering committees may provide direction to the project within their mandated area of responsibility.	
Strategic Plan		A plan that outlines an organization's long-term vision (10 to 20 years) of where an organization wants to be and how to get there strategically.	
Strategic risk		Strategic risk relates to business, environmental or regulatory factors impacting service delivery.	
Supplemental conditions	SCs	The section of the bid opportunity or request for proposals that supplements or modifies the General Conditions and sets out terms and conditions specific to the Contract.	
Tangible Capital Asset	TCA	Tangible capital assets are those capital assets of an enterprise such as property, plant, and equipment, that have physical characteristics or presence The City uses this process called depreciation to allocate part of the asset's expense (value) to each year of its useful life, instead of allocating the entire expense (value) to the year in which the asset is purchased.	
The City of Winnipeg	the City	The City of Winnipeg as continued under the City of Winnipeg Charter.	
Top-down estimating		Approximating the size (duration and cost) and risk of a project (or phase) by comparing the project as a whole to similar projects. The comparison may be made directly using "analogous estimating," through an algorithm as in "parametric estimating," or from the experience of estimating experts.	
Useful life		The shortest time span associated with the asset's physical, technological, commercial, and legal life.	
Value Engineering	VE	Exercise that uses engineering effort to reduce construction costs, optimizes life-cycle costs, or improves quality.	
Value for Money	VfM	Term used to assess whether the City has obtained the maximum benefit from the goods and services it acquires and/or provides, within the resources available to it. VfM measures the cost of goods and services and evaluates the mix of quality, cost, resource use, fitness for purpose, timeliness, and convenience to determine whether, when evaluated as a whole, they constitute good value. Achieving VfM may be described in terms of the "three Es" – economy, efficiency, and effectiveness.	

Glossary			
Term	**Acronym**	**Definition/Explanation**	**Owner**
Value management		A structured team-based approach that uses concepts and methods to create sustainable value for both the City and stakeholders. Value management identifies functional requirements of projects/contracts to achieve optimum function for minimum cost. The aim of value management is to reconcile stakeholders' views and to achieve the best balance between satisfied needs and available resources.	
Whole-life costing		The total cost throughout its life including planning, design, acquisition, and support costs and other costs directly attributable to owning or using the asset, including disposal costs. OR An economic assessment considering all agreed projected significant and relevant cost flows over a period of analysis expressed in monetary value. The projected costs are those needed to achieve defined levels of performance, including reliability, safety, and availability. <u>Whole-Life Costing vs Life-Cycle Costing</u> Life-cycle costing refers to the periodic replacement of assets based on typical asset life spans, whereas whole-life costing evaluates investment options, based on an evaluation encompassing all of the relevant costs of ownership over a defined time span. Broadly, life-cycle costs are associated directly with constructing and operating an asset, while whole-life costs include other costs such as land, income from the asset, and support costs associated with the asset. The expertise of the construction industry is best placed to deliver life-cycle costs, which clients can use to calculate whole-life costs.	
Work breakdown structure	WBS	A hierarchical representation of the work to be executed in a project to accomplish the project objectives and create the required deliverables.	
Workplace Safety and Health Act	WSHA	An Act intended to "secure workers and self-employed persons from risks to their safety, health and welfare arising out of, or in conjunction with, activities in their workplaces." Federal, provincial, and territorial governments are used as a guideline in Manitoba for drinking water quality.	

Appendix E
Procedure

Procedures - Embedded in the PMM

Procedures - Stand Alone Procedures

Contract Administration Procedure

Change Management Procedure

Record Management System Procedure

Public Engagement Procedure (Under Development)

Design Management Quality Procedure (Future)

Procedure E: Procedures Embedded in the PMM

Procedures provide the detailed instructions for completing the work processes. The PMM describes the work processes in the main body of the text, and in most cases also includes the procedures as a "How to" explanation.

The table below lists the procedures and where they are referenced in the PMM document. By referring to the referenced section the details can then be found within the document or the appendices.

Section #	Procedure Title	Page #

Section #	Procedure Title	Page #

Section #	Procedure Title	Page #

Project Management – Contract Administration Procedure

Procedure #	
Description:	Outlines the key administrative elements to manage a contract

Overview

Objective

To ensure contracts are administered in a consistent and transparent manner.

Roles, Responsibility and Authority

Role	Responsibility	Authority
Sponsor	To process contract documents in a timely manner	
Project Manager	Support the CA To provide QA/QC on the contract to ensure this procedure is being followed. To process contract documents (such as change control documents) in a timely manner	
Contract Administrator	To follow the procedure	
Care & Control Owner	Provide timely input into the Change Control process	

Procedure details

Document Revision No.	Revision	Date Released	Released By:

Definitions

The PMM and this procedure use a common set of definitions which are referenced in PMM Appendix D Glossary of Terms.

Introduction

The reason for undertaking a project is to achieve the benefits defined in a specific business case. The project is delivered by managing the project, administering contracts and completing the product work. The processes and procedures for project management and contract administration are defined in the PMM. The main body of the PMM provides the concepts of project delivery and the processes and procedures specific to project management, while those for contract administration are outlined in this document.

This document provides the contract administration procedures for reviewing, monitoring, controlling, communicating, clarifying, interpreting, making decisions and fulfilling the City's obligations. It applies to contracts with various types of vendors, including consultant assignments and construction contracts.

While the general intent is to comply with the approach defined in the PMM contract administration services must be carried out in accordance with the terms of the contract being administered. In the event of conflicts with the terms of a contract, the contract documents generally take precedence over the PMM.

The type of contract may also impact on the processes and procedures to be applied. The procedures in this document have been prepared for the DBB approach. Under performance based contract the means and methods may reside with the contractor, in which case the project management and contract administration roles will be much different, and will be appropriately identified in the business case or PDP.

All City of Winnipeg contracts incorporate General Conditions (GC) with boiler plate terms and conditions governing the contracts, and the Supplemental Conditions which may alter specific GC clauses. The contract administration procedures of this document are modeled after the City of Winnipeg's GCs for DBB contracts. Current version of the GCs can be found at: http://www.winnipeg.ca/matmgt/gen_cond.stm

The contract administrator (CA) is responsible for contract administration and is the City's representative throughout the duration of the Contract as described in PMM Section 5.6. The CA has the authority to act on behalf of the City to the extent expressly provided for in the Contract. The CA role may be assigned to a representative from either the City or a consultant.

The City PM is responsible for the entire delivery chain and will retain oversight over the contract administration services. All reporting and requests for approval originating from contract administration are to be directed to the PM.

In accordance with the foregoing, the CA is to utilize processes, procedures and templates identified within this document to deliver the DBB contract administration services. Application to consultant contracts will require selection and application of the appropriate procedures.

Records and Reporting

This section identifies the process the CA will follow for records and reporting pertaining to the Contract, which reporting will be conducted throughout the duration of the Contract and how the information will be filed.

The CA is responsible for developing or compiling contract information and records, and preparing and issuing reports. The records and reports are to be completed and distributed in accordance with the PDP communications plan. It is

essential that timely information is produced, which means that unless defined otherwise, it is to be distributed within 48 hours of its creation.

Forms and Records

The CA is responsible for maintaining a complete and orderly file of all aspects of a Contract. This is to include complete files on scope, cost, schedule, and quality, as well as level of effort and site issue reports. The entire correspondence file of reports, forms, memos and minutes of meetings is an important part of that record.

As a minimum, the CA is responsible for generating the following specific records throughout the course of the Contract:

- **Meeting minutes**: Minutes of all regular and special contractor meetings, coordination meetings and conference calls.
- **Scope change documents:** Coordination, compiling and preparing Change Management Documentation including Contemplated Change Notices (CCN), Changes Orders (CO), Field Work Authorizations (FWA) and Contractor Claims.
- **Clarification and directives:** Collection and dissemination of additional Information requested by or provided to the Contractor including Requests for Information (RFI) and Field Instructions (FI).
- **Quality Assurance:** Collection and filing of inspection documents and remedial works including Construction Review Records, Test Records and Non Conformance Reports.
- **Daily Progress Reporting:** Prepare or cause to be prepared Daily Construction Reports containing, inspections completed, labour resources on site, equipment on site, problems encountered, activities started, completed and planned, site conditions, work stoppages, unusual events and verbal instructions given to the Contractor

Other important records that must also be maintained and filed are design notes, shop-drawing logs, job photographs (which should be filed with the progress reports), and change orders.

The shop-drawing log should show as a minimum: a number identifying the individual drawing, drawing titles, the date it was received, to whom it was forwarded for review, the date it was returned, and the current status of the drawing (accepted, additional information or revisions required).

Job photographs should be fully documented and include a digital date of when the photograph was taken. That number should be referred to in a file explaining who took the photograph, the direction the photo was taken, and the activity reported to be shown by the photograph. These records are necessary for a potential legal challenge to accuracy.

Bid documents and job diaries are to be included as part of the permanent Contract record. These include the Contract Documents - the Bid Opportunity submission, Bidding Instructions, addenda, GCs, SCs, drawings, specifications, , Shop Drawings, Performance Security and all other exhibits mentioned in the Contract Documents as forming part thereof (e.g. equipment certification, equipment warranties, performance certificates). Record drawings (i.e. "as-built drawings") showing revisions and additions to the original plans must also be maintained as a part of a proper job record.

Reporting

Reporting includes compiling records of the contract administration details and responding to the requirements of the PDP. The following reporting may have been pre-defined under the PDP, and if not is required as part of the contract administration procedures, if applicable to the type of contract:

- Monthly Construction Status Reports
- The CA shall compile and submit to the City, Monthly Construction Status Reports. The reports shall contain the following:
- Executive Summary
- A written summary of the current and cumulative progress of the Contract identifying major activities completed during the period, major activities planned for the next period and any areas of concern.
- Safety and Security

- Provide an overview of Contractor's safety performance including Record of Incidents, Investigations, Permits, Trainings, Inspections, Hazard Reviews, Notifications and Safety Committee Meetings held.
- Cost Reporting
- A commitment based cost report reflecting costs committed to date, invoiced to date, percent complete, forecast to complete, estimate at completion and variance.
- A Detailed Contract Status report listing all approved COs to date, all outstanding CCNs, FWAs, Detailed Progress Estimate Listing reflecting Holdbacks retained, Manitoba Retail Sales Tax (MRST) included or self-assessed, amounts paid to Contractor, dates paid and holdback releases.
- Construction Progress
- A construction schedule presenting actual vs. planned progress shall be updated to reflect performance to date. The schedule can take the form of Gantt Charts, S-curves and histograms to demonstrate the progress of the Contract against the baseline.
- Quality Assurance
- This section of the report will provide a listing of Inspections, Reviews and testing completed during the previous period as well as status reports of all Non-Conformance Reports (NCRs).

During the construction phase of a contract, the CA is responsible for maintaining communications between the three parties (the City PM, the Contractor and the CA). Communications are divided into two broad categories: contract reports and records.

Contract Reports

Reports provide comments, advice, recommendations or observations on any aspect of the construction. There are four categories of reports: cost control, quality determinants, progress reports, and level of effort reports.

Costs are divided into two broad categories: payments to the Contractor and payments to others. Payments to the Contractor include regular and final progress payments for the Work of the Contract and for extra work or Change Orders. Payments to others may include the contract Consultant, their sub-consultants, testing laboratories, utility companies, other Civic departments working on the site, property acquisition costs, suppliers, etc.

It is the responsibility of the CA to assess and contract costs on a regular basis and to report at least monthly the cost-to-date, the contracted contract cost and any variations from the budgeted contract cost. The CA's estimate of cost becomes the basis for preparing progress estimates.

The CA is also responsible for monitoring other contract costs, and for verifying and recommending payment. Where predetermined costs have been established, the CA shall also indicate cost variations and provide an explanation and justification of any significant variation from the estimates.

The cost control report prepared by the CA is to indicate for each of the contract cost components (contract cost, consultant cost, utilities, testing, etc.):

- budget funds for the component
- cost for current period
- cost-to-date including approved changes
- contracted final cost

This information allows the City PM to anticipate funding shortfalls and take appropriate measures (e.g. report to Chief Administrative Officer for transfer of funds, etc.).

Quality of work reports cover material testing reports and inspection reports related to workmanship. The testing and inspection is usually done by specialists in their particular field. Their reports are immediately received by the CA, who reviews for compliance and disseminates the information.

Acceptance of material quality is usually subject to evaluation of a number of characteristics of the material, whether it be concrete, asphalt, paint, electrical equipment, etc. The Specifications in the Contract Documents include a quality assurance program against which the materials are tested. The methods used to test the material usually refer to

national standards (e.g. CSA, CGSB, ASTM, etc.). Reports from testing laboratories typically indicate the characteristics being measured, the specified requirements, and the test results.

Workmanship is defined in the contract specifications, and usually refers to "minimum acceptable standards" (e.g. tightness of bolts, soil compaction, etc.) or to subjective measures (e.g. "no visible overlap in paint"). The inspection firm's report contains measured findings (e.g. compaction) or evaluation of workmanship based on typical industry standards (e.g. concrete finish).

In order to complete progress and level of effort reports, it is usually necessary for the CA to prepare a scheduled daily report or combination of reports indicating:

- the precise work and activity descriptions, separated as to physical location;
- the labour force, broken down by Sub-contractor, locations, and major activities;
- equipment on the site, and whether it is being used or stored by the Contractor;
- the weather conditions and temperatures at key times of each day;
- other contractors, utilities, agencies, etc., on the site.
- site clarifications, interpretations or instructions issued to the Contractor;
- proposed change notices issued to the Contractor;
- change order work accomplished, with relevant details;
- photographs taken during the day;
- visitors to the site;
- meetings, discussions, commitments and conversations.

Such scheduled reports indicate the exact nature of the construction operation. Several of these scheduled reports can be combined into one format. The information may be on a single form or on several forms. What matters is that all the information is recorded in every time period and filed in logical sequence.

From the daily reports, the CA can provide the City PM with a complete current report on the contract status on a monthly basis.

Written records in template or report format are required for all correspondence. The records are to be filed electronically. Hard copies are not required unless specifically identified. In many cases this may require conversion of hard copies to electronic format for filing.

Copies of incoming correspondence are to be stamped with the date and time received, the initials of the persons reviewing the communication, and notations of action taken as a result. Depending on its complexity, it is advisable to assign unique numbers to all correspondence and to maintain a log of all correspondence.

In addition to two-way, job-related written correspondence, internal reminders such as memos to file are important and should be systematically maintained by the CA. Other communications (telephone calls, meeting minutes, conversations, and general ideas on the contract) that form the basis for a job-related activity should be recorded in memoranda and filed with other correspondence.

Meetings

The CA shall arrange and chair all contract administration site meetings including preparation, distribution and filing of minutes within three business days of the meeting date.

The minutes of meetings represent an invaluable source of evidence to prove or rebut claims of delay. Minutes of job site meetings are of little value unless they indicate why the meeting was held, when and where it was held, who attended, what was discussed and agreed upon, and the resulting action. They are usually prepared at a time when litigation is not yet contemplated and therefore they tend to be more accurate. In a large construction contract, these minutes will be very extensive.

General guidelines for minutes of meetings include:

- Use outline format. Keep the minutes in outline form to maintain clear, to-the-point representations. Number the meetings. Separate "old business" (from prior meetings) from "new business." Number each

successive item in each section. This will make all references to any specific job meeting discussion fast and accurate (e.g. "Job Meeting 4, Item 4.4").

- Where items are being carried over to other meetings, it is helpful to maintain the reference number from the initial meeting in which the item was discussed (e.g. "Job Meeting 7, Item 4.4" - initially discussed in Meeting 4 and discussed again in Meeting 7).
- Where an item is discussed over a number of meetings, it is also helpful to recopy in the minutes the statements made about the item from previous meetings, added in chronological order. This allows for quick reference of the action taken to date without "digging" through previous minutes, and is easily accomplished with word processing software used today.
- Use a title for each item. A summary description clarifies a paragraph's subject. They make research fast and correlation of topics easy. Use exactly the same wording in each meeting that the item is discussed. Issues that continue through numerous meetings can be clearly tied together through their consistent title.
- Include all appropriate references in an item title. If it involves a change order, include the change order number in the description. If it involves a change in the schedule, a direction from the CA, or whatever, note it as such. The inclusion of related numbers will relate the discussion to all the affected files.
- Name names. Avoid using titles; use the person's name instead.
- Use short but specific statements. Be concise. Read back the exact language at the meeting. Get agreement that the representation is entirely accurate and that everyone understands the implications, as well as the obvious.
- Require definite action. Include the names and the precise dates that action is required by. Ask frank questions at the meeting. Narrow complex or difficult issues down to the next step required in the resolution process. Confirm "whose court the ball is in" and write it down.
- Notify all recipients of the meeting minutes to advise the writer of any errors or omissions in the minutes. Include such a request on the meeting minute form itself. Request acknowledgement of the accuracy of the "old business" at each meeting before proceeding to the "new business." Include any resulting acknowledgement or corrections as the first item of the "new business."

Pre-Award Meeting

The pre-award meeting is to be held in accordance with the PMM. The CA participates and may be chairperson for the meeting.

Pre-Construction Meeting

The CA shall convene a preconstruction meeting and include representatives of management from the various parties who have the authority to make decisions, so as to resolve any problems that may arise. The preconstruction meeting should be held in conjunction with a site inspection to verify site conditions and the need for preparatory works.

Templates should be used for the agenda and for recording of meeting minutes.

The preconstruction meeting is conducted to address a number of purposes, including:

- the introduction of contract personnel from the City, the CA and the Contractor. Often persons representing utilities, other City departments, key Sub-contractors and other contractors who have a major impact on the Work may be in attendance,
- to establish lines of authority and lines of communication,
- to review the status of the Contract,
- to review the contract schedule, including existing site activities and any constraints to the Work,
- to identify start-up requirements, and
- other items pertaining to the Contract.

At the preconstruction meeting, the following persons should be represented:

- City personnel responsible for on-site administration of the Work, and for office administration.
- Representatives of the CA (if not City personnel) responsible for on-site and office administration and inspection of the Work.

- Contractor's contract manager and site superintendent.
- Representatives of principal Sub-contractors.
- Representatives of other contractors (other than Sub-contractors), utilities or other City departments who are currently working on the site and whose work will impact on the Work of the Contractor.

Minutes of the preconstruction meeting are to be kept by the CA, which is to include the following:

- The contract description and reference number (File. No.)
- The date, time and location of the meeting are to be recorded.
- The persons present at the meeting are to be recorded.
- The purpose of the meeting is to be stated.
- Notes on the following agenda items are to be recorded:
    i. Identify contract personnel from the City, the CA and the Contractor, and specify the respective role and responsibilities of each individual (lines of communication) relative to the Contract.
    ii. Review the Contract award. State that the Contract was awarded to (successful bidder). Report the date that the letter of intent was issued, and indicates that this date is to be used on all relevant documents.
    iii. Review insurance and bond requirements. Report on the status of submissions by the Contractor and, where required in the Contract, their Sub-contractor(s); and on the status of any City insurance.
    iv. Review the Contract Schedule. Review labour resources and equipment proposed to maintain the schedule. Discuss need for any changes to the schedule. Request updates to the schedule as appropriate.
    v. Review procedures for issuing and revising design information and authorizing changes.
- Discuss site security. Discuss protection requirements for the public. Discuss security requirements for site storage of materials which are to be used/incorporated into the Work.
- Review material orders. Identify any delivery problems.
- Review contracts between major Sub-contractor(s) and the Contractor in terms of these contracts meeting the terms and conditions of the City's Contract with the Contractor, particularly in the area of scheduling. This is a follow-up to the pre-award meeting, where this requirement for Sub-contractor contracts is to be emphasized.
- Review Contractor's requirements for Construction Drawings and Specifications.
- Review the activities of other contractors, utilities, other City departments and other agencies (e.g. Heritage resources) on the site. Review their respective schedules, clearances required and resulting impact on the Contract.
- Request a list of emergency phone numbers from the Contractor.
- Discuss site facilities - Contractor's field office, CA's field office. Is CA's field office adequate as per Specification? Determine location of field offices (if not previously specified).
- Review site access constraints and special requirements.
- Discuss traffic and pedestrian accommodation and control.
- Identify resident/business concerns and appropriate action required.
- Discuss temporary services to be provided by the Contractor or others.
- Discuss hours of work, including any restrictions on the hours of work, and records to be kept by the Contractor and provided to the CA.
- Discuss layout of the Work. Identify layout requirements and identify responsibilities for various stages of layout (e.g. control survey; construction survey) of both Contractor and CA.
- Answer any questions relating to the Contract Documents.
- Review the submissions, shop drawings, material approvals, etc. Required in accordance with the Specifications. Identify a schedule for each submission and the process for same (i.e. "who gets what").
- Discuss expectations for site clean-up.
- Review environmental procedures/constraints.

- Discuss approvals to be obtained by Contractor prior to commencing work (e.g. Navigable Waters approval from Transport Canada to construct temporary structures in rivers - work bridges, etc.).
- Determine date for next meeting, whether or not said meeting is a special meeting or first regularly scheduled site meeting.
- Identify a list of persons who are to receive minutes of this meeting and any other meeting, in addition to persons attending the meetings.
- Identify a list of persons who are to receive a copy of any correspondence relative to the Contract.

The CA is responsible for preparing and distributing detailed minutes. The minutes are to be distributed to all attendees and to other persons having key input into the contract.

To be effective, these minutes must be distributed in a timely manner to all parties for confirmation of the accuracy of the minutes and to allow sufficient time for required actions to be taken prior to the next site meeting.

Site Meetings

Depending on the scope and nature of the contract, the CA shall convene weekly or bi-weekly meetings with the Contractor and record minutes of such meetings.

Site Coordination Meetings

On projects or programs where multiple contracts are awarded, the CA shall arrange regular coordination meetings to facilitate logical sequencing of the Work. Minutes of the meetings shall be prepared by the CA. The minutes shall record agreed upon dates, timeframes and actions by respective parties

Regular site meetings should be held at the site and include representatives of management from the various parties with the authority to make decisions, so as to resolve any problems that may arise. Site meetings should be held in conjunction with a site inspection to observe progress and quality of work. The meetings should focus on immediate contract needs and allow for resolution of conflicts.

Special meetings or conference calls shall be convened by the CA as may be required to resolve issues with a smaller focused group or to disseminate special materials pertinent to the progress of the Work. The CA shall chair and record minutes of such meetings and conference calls.

A meeting agenda is to be prepared for each type of meeting. Regular Contractor site meetings shall address the following:

- review progress to date
- discuss expected progress
- review Contract Schedule
- identify coordination needs of CA
- identify and resolve any problems occurring during construction, and
- other items pertaining to the Contract.

At regular site meetings, the following persons should be represented:

- City personnel responsible for on-site administration of the Work, and for office administration.
- Representatives of the CA (if not City personnel) responsible for on-site and office administration and inspection of the Work.
- Contractor's contract manager and site superintendent.
- Principal Sub-contractors, when requested.
- Representatives of other contractors (other than Sub-contractors), utilities or other City departments who are currently working on the site and whose work will impact on the Work of the Contractor.

Accurate minutes are to be kept by the CA. The minutes of job site meetings are essential to the Contract, as they become an official part of the Contract record, and are a valuable history of the Contract in the event of disputes. The following content should be included in the minutes:

- The contract description and reference number (File. No.)
- The date, time and location of the meeting are to be recorded.
- The persons present at the meeting are to be recorded.
- The purpose of the meeting is to be stated.
- Notes on the following agenda items are to be recorded:
    i. Review the Contract Schedule.
        - Review progress to date and expected progress until the next regularly scheduled site meeting.
        - Review the progress to date against the Contract Schedule.
        - On "working day" contracts, identify the number of working days used since the last meeting and in total. Identify "lost" working days and the reasons for same.
        - On "completion date" contracts, identify whether interim or stage completion dates have been achieved.
        - Review material orders. Identify any delivery problems.
        - Track construction and material delivery activities which are behind schedule.
        - Review the ongoing activities of other contractors, utilities, other City departments and other agencies (e.g. Heritage Resources) on the site. Review their respective schedules, clearances required and resulting impact on the Contract Schedule. Determine coordination requirements.
        - Discuss the action to be taken by the CA and the Contractor to maintain the Contract Schedule (labour resources and equipment needs or other action necessary to maintain the schedule).
        - Discuss any necessary revisions to the schedule. Request updates to the schedule as appropriate.
- Review and approve the minutes of the previous meeting. Review errors and/or omissions reported from the previous minutes, and follow-up on outstanding activities/issues.
- Discuss extra work requirements. Review extra work orders issued since last meeting, discuss method of payment, record keeping requirements, etc. for the extra work. Receive requests for extra work from the Contractor. Determine the impact of extra work on the Contract Schedule.
- Discuss any changes identified in the Change Log and their impact on the Contract Schedule and Contract Price.
- Review RFI Log, submissions and approvals (e.g. insurance, shop drawings, maintenance manuals, mix designs, design notes, engineering drawings produced by Contractor's engineer for temporary facilities/structures, warranties for materials, etc.). Review whether the submissions are being provided in accordance with the schedule predetermined for each submission.
- Identify resident/business concerns and any appropriate action required. Review adequacy of traffic and pedestrian accommodation and control.
- Review the adequacy of temporary services being provided by the Contractor or others.
- Review site security. Review protection requirements for the public. Review security requirements for site storage of materials which are to be used/incorporated into the Work.
- Review insurance needs/renewals for the Contractor and/or their Sub-contractor(s).
- Identify defects in the Work and discuss remedial measures to be taken.
- Discuss complaints, inquiries, claims, etc. received since the last meeting and any required action.
- Schedule inspections/final inspection by City personnel as appropriate.
- Schedule special meetings to deal with specific problems affecting the Work of the Contract.
- Determine a date for the next meeting, and identify whether said meeting is a special meeting or a regularly scheduled site meeting.

Following discussion of the various items, the decisions reached should be included in the minutes. The minutes are to be distributed by the CA to all attendees and to other persons having key input into the Contract. To be effective, these

minutes must be distributed in a timely manner to allow sufficient time for review and action prior to the next site meeting.

Contractor Submittals

This section describes the responsibilities of the CA with regard to Contractor submittals throughout the duration of the Contract. The CA shall obtain a listing of submittals and submittal schedule from Contractor.

The CA shall notify the PM of any requested substitutions, alternates or equivalents proposed by the Contractor during the course of the Work.

Shop Drawings and Product Data

The CA will receive Contractor shop drawings, log drawings into the Submittal Log Template and transmit the shop drawings to respective design disciplines for review. Unless stipulated in the contract or agreed otherwise, the shop drawing review period shall be no longer than 10 working days. The respective design disciplines shall return the reviewed shop drawings to the CA for recording the review status in the shop drawing log and transmission of the Reviewed, Reviewed as Noted or Revise and Resubmit shop drawings to the Contractor. Only Reviewed or Reviewed as Noted shop drawings shall be used for the Work. Shop drawings stamped “Revised and Resubmit” are to be acted upon accordingly by the Contractor. The CA shall place copies of the Reviewed or Reviewed as Noted shop drawings in the Contract File.

On instances where multiple contracts have been awarded on the Contract, the CA shall review the shop drawings with respect to work of other contracts and transmit copies of the reviewed shop drawings to the other Contractors for coordination with their works.(e.g. anchor bolt layouts from an equipment vendor to the concrete contractor for embedment).

Samples

All samples submitted by the Contractor will be logged by the CA in the Submittal Log, identifying the Date of Submission, origin, intended use in the Work and any deviation from the requirements set out in the Contract Documents. The samples shall be reviewed by the appropriate reviewer and comments recorded on the Submittal Log. The CA shall advise the Contractor regarding Acceptance or Rejection of the sample and record same in the Submittal Log.

Operations and Maintenance Manuals

Upon receipt of O&M manuals from the Contractor, the CA shall review the manuals for compliance with the Contract documents. The CA will send the O&M manuals to the respective design disciplines and the City PM for their review and approval. The CA will compile the review comments from the reviewers and return the compiled comments to the Contractor for incorporation into the final O&M manual submission.

The CA shall ensure the O&M manuals (first draft) are submitted and available for Pre-commissioning prior to issuance of Certificate of Substantial Performance.

Training Materials

The CA shall receive, track and review lesson plans and other training materials. The CA shall forward training materials to the City PM for review and comment. All submittals shall be recorded in the Submittal Log with their status identified.

Spare Parts

The CA shall coordinate receipt of, inspection, tracking and storage of all spare parts in a location designated by the City PM. The CA shall create a listing of spare parts including description, specification reference and relative equipment tag.

Health, Safety, Security and Environment

The following section outlines the CA’s duties in relation to Health, Safety, Security and Environment (HSSE). The minimum standard for all City of Winnipeg construction sites is the Safe Work Plan, Workplace Safety and Health Act (WSHA) W210 and Regulation MR 217/2006 and Contractor Safety Management Plan. In the event of a conflict of standards the most stringent standard shall apply.

Health and Safety

The CA and the contractor must ensure effective ongoing exchange of safety information as well as notification in the event of an incident or emergency situation. It is strongly recommended that contract contacts are posted at the job site for contract work taking place at City of Winnipeg facilities to ensure this information is available to City supervisors and employees working in the area.

Site Health and Safety Orientation

Before contract work begins, site-specific safe work and emergency procedures must be communicated to contractors by the CA in consultation with City's safety resources as needed.

Contractors are also to be briefed on roles and responsibilities as well as the consequences of not following the Safe Work Plan or any site-specific safe work procedures. This includes the corrective action that will be taken to stop unsafe work and the subsequent remedial measures.

This is consistent with the duty to provide information that may affect the safety and health of a person at the workplace as per the Manitoba WSHA.

Hazard Communication

Effective ongoing communication between the CA, the contractor and any subcontractor is essential to identify situations that may arise during the course of work not originally discussed or identified. It is also important that any changes to Safe Work Plans be made and communicated on an on-going basis. Safety is to be an integral part of pre-work discussions and contract meetings.

Monitoring Contractor Safety

Safety monitoring is performed along with other aspects of contract work during site visits by the CA. This is done to ensure that contractors follow the City's safety requirements as well as the Safe Work Plans for the work being done.

The CA should consult with the City's PM and safety resource if they have questions or need assistance with the monitoring process.

How often a site is monitored can be determined by:

- The nature of work and the risks involved.
- The contractor's familiarity with the work being done and whether the work was done previously by the contractor for the City and without incident.
- The level of knowledge and experience the contractor has with respect to safe work and emergency procedures.
- Whether or not the contractor has obtained a recognized safety certification e.g. COR™ or SECORTM

Safety monitoring can be random or announced, narrow in focus or more encompassing depending on the type and complexity of the work being performed. If unsafe work is observed, corrective action is taken by the CA or others. Corrective action can range from immediate work stoppage until appropriate control measures are implemented up to and including termination of the contract in extreme situations.

Responding to Safety Concerns & Follow-up

If a City employee becomes aware of a safety concern involving contract work the first step is always to notify their direct supervisor. It is the supervisor's responsibility to evaluate and respond to the concern in a timely manner in consultation with safety resources and the CA.

Contractors have the same obligations to their employees as any other employer in Manitoba. Where safety issues arise regarding contractor employees the concern will always be taken to the supervisor of the employees involved.

The City has the right to require the contractor to resolve any safety issue raised to the City's satisfaction before work continues. This decision belongs to the CA responsible for the contract with support from any safety resource needed.

In circumstances where contract work could result in serious and imminent harm to a person, all employees are encouraged to take immediate corrective action to address the situation in a way that does not endanger themselves or

others. This may mean stopping the work in progress and contacting their supervisor to address the situation with all stakeholders.

Health and Safety Reporting

The CA shall include in the Monthly Status Report a listing of all recordable incidents that occurred during the reporting period.

Investigations

The scene of an incident shall not be disturbed until permission is given by the CA, City and by Manitoba Workplace Health and Safety. Investigation of the incident will be performed by Contractor and City. The CA shall obtain the resultant investigation documentation. The CA shall file the generated safety documentation in the Contract File's for record purposes.

Security

The CA shall review the Prime Contractor's access control plan. The Prime Contractor shall conduct site orientations for all personnel requiring access to the construction site.

Visitors

For major job sites, the CA shall obtain prior approval from the City PM, for visits of non-resident personnel to the site. The CA shall provide the City PM with a list of non-resident personnel with the intended date of visit, reason for their visit and the expected duration of the visit. Non-resident inspectors do not require pre-approval but must complete an Inspection Report supporting the visit and provide the CA with a copy for the Contract file.

Unscheduled media representatives, journalists and others shall not have access to the site. The CA shall refer them to City PM and City of Winnipeg Media Relations.

Plant Access

For projects on an operating plant, the CA shall coordinate access for work undertaken within the plant. A Plant Entry Permit shall be completed listing all workers, description of work to be performed and expected duration of work activity. The Plant Entry Permit shall be signed by the plant operator in charge, Contractor and CA. A signed Plant Entry permit will be required each day in-plant work is required. Contractor shall request from the CA a Plant Entry Permit no later than 3:00 pm the previous day.

Security

For projects where security is of concern, the CA shall review the Contractor's security plan for the site. The Contractor shall provide the CA with a Criminal Record Search Certificate for each individual proposed to perform work on the site prior to their engagement in the Work.

Permitting

The following permit process applies to major work on operational facilities only. In other cases the CA shall review work requirements with the City PM and establish safety protocols accordingly.

The CA shall ensure the following Permits are completed by the Contractor for work to occur within an operating plant and are signed by the Plant Operator in Charge. Some of the key permits that need to be obtained:

- Plant Entry Permit
- Process Interruption Permit
- Lockout Tag Out Permit
- Hot Work Permit
- Confined Space Permit

The CA shall ensure the following permits are produced by the Contractor for work adjacent to an operating plant. Permits for this work do not require Plant Operator in Charge sign off.

- Confined Space Permit

- Critical Lift Permit
- Lockout Tag Out Permit
- Pressure Test Permit

Environmental

Safe handling and storage of fuel, oils, and chemicals shall be of the highest priority and care. Any mishap shall be immediately reported to the CA.

The CA shall immediately notify the City of such spills in accordance with established City of Winnipeg protocols and monitor the Contractor's containment and remediation actions. The CA shall obtain copies of Contractor's incident report and investigation and file in the Contract File's.

Schedule of Work

All construction contracts require schedules for completion. The time element may involve specified commencement and completion dates, or specified working days. Large or more complex contracts may involve more detailed performance schedules for individual critical work activities.

This schedule is a tool that the CA uses to monitor and control the Contract work. The Contractor shall submit a Detailed Construction Schedule, incorporating the planned schedule as set out in the SCs of the Contract, for the CA's review. The CA shall forward the schedule along with their recommendation to the City PM for review and approval. This Schedule then forms the Contract Time baseline to which actual progress is tracked. It is an enforceable obligation of the Contract, like every other aspect of the Contract, and thus, a party causing delay, which results in increased costs, is likely to be liable for additional costs resulting from the delay.

The contract schedule to be provided by the Contractor is dependent on the complexity of the contract. It may vary in format from a reproduction of the Schedule of Work contained in the Bid Opportunity Submission, to more detailed Gantt charts or a detailed CPM chart for individual critical activities.

Progress reviews shall be carried out on a regular basis, typically at the regularly scheduled site meetings. Activities which are behind schedule are to be identified, and corrective actions identified to bring those activities back on schedule. Progress reviews may be augmented by special or additional meetings to discuss critical activities which are behind schedule.

The onus is on the Contractor to bring the work back on schedule. Depending on the circumstances behind the delay, the Contractor will have to consider whether to:

- deploy more resources by bringing additional labour and/or equipment onto the site;
- shift contract resource to address the activity behind schedule;
- increase working hours;
- bring in a Sub-contractor to complete the late activity;
- change Sub-contractors who are not performing in accordance with the Schedule;
- review remaining activities to see if there is opportunity to recover lost time on future activities;
- substitute existing equipment on site with higher productivity equipment;
- change suppliers (if they are dealing with a supply problem), as approved by the CA;
- substitute materials, as approved by the CA.

Revisions to the Schedule

Where the Schedule must change, it may only be revised with the prior written consent of the CA, and only to reflect valid changes in the Work or delays beyond the control of the Contractor.

Should the Contractor fail to meet the Schedule, liquidated damages are to be assessed in the manner indicated in the GCs and the SCs of the Contract.

Delays in Completing Work

Construction delays fall into different categories, as follows:

Compensable delays: are typically delays caused by the City. These types of delays are compensable in that they may be corrected by extending the Contract Time or by providing additional compensation for damages. Examples of these types of delays not caused by the contractor include:

- late award of the Contract,
- failure to make available or to provide unimpeded access to the site,
- late delivery of City-supplied equipment or materials,
- failure by others to complete preliminary work or undertakings,
- delays that result from another Contractor's work,
- late provision of plans, drawings, and other information or instructions from others
- failure by the City to make interim payments as required,
- City financing problems,
- failure to receive time extensions as provided for in the Contract, and
- legitimate extras

The consequence of a compensable delay is that the City must give the Contractor an extension of the time(s) specified for the phase or phases of the Work and/or for the dates specified for Substantial or Total Performance of the Work.

Non-Excusable delays: are those caused by the Contractor, such as their own inability to complete the Work on schedule or delays caused by their sub-contractors.

Excusable delays: involve delays beyond the control of the City or Contractor (Force Majeure). These may include strikes, lock-outs (including lock-outs decreed by a recognized contractor's association for its members of which the Contractor is a member), an act of God, or any other cause which the Contractor satisfies the CA to be totally beyond his control or any cause within the Contractor's control which the CA has determined is an excusable delay. In these cases, the Contract Time shall be extended for a period of time equal to the time lost due to such delays. Extensions in Contract Time shall be recorded via CO.

Owner Supplied Equipment

Introduction

The City may pre-purchase equipment with long delivery times or for cases where detailed equipment information is required to complete the detailed design works. The following outlines the CA's responsibilities with respect to Vendor submittals, Factory Acceptance Testing, Receipt of Goods, and the installation, testing and commissioning of all owner supplied equipment.

Vendor Submittals

The CA shall receive, review and process, and log submittals from City Supplied Equipment Vendors. Typical Submittals include manufacturer Shop Drawings, Inspection and Test Plans (ITP) and Operations and Maintenance (O&M) Manuals. The CA shall forward copies of the shop drawings to the installation contractors.

Factory Acceptance Testing

The CA shall review ITPs and coordinate Factory inspection and tests whether they are performed by third party agencies or by the design consultant. The CA shall estimate the costs associated with all factory inspections and submit to the City for approval prior to arranging the inspections and tests. The CA shall obtain and review all Factory Acceptance Testing (FAT) results and incorporate into the Contract File.

Delivery and Receipt of Goods

The CA shall coordinate the shipping and receipt of City Supplied Equipment with the Contractor. Once the Goods have arrived to site, the CA, Contractor and Manufacturer shall inspect the goods and complete the Certificate of Equipment Delivery form which transfers the Care and Custody of the Goods to the installing Contractor. Any deficiencies noted during the inspection shall be listed on the Form. The completed form shall be provided to the CA prior to the Manufacturer leaving the site.

Installation

Prior to installation of the equipment, the Manufacturer and Contractor shall complete the Certificate of Readiness to Install form signifying the Contractor has received adequate instruction relative to Installation of the Goods. The Manufacturer shall provide the CA with a fully signed copy of the Form prior to leaving the site. The CA shall incorporate the signed forms into the Contract file system.

Once the Contractor has completed Installation of the equipment, the Contractor shall notify the CA that the Installation is ready for inspection by the Manufacturer. The CA shall coordinate the Manufacturer's inspection and have the Certificate of Satisfactory Installation form completed and signed. Any deficiencies in the installation shall be noted on the form. The fully signed form shall be delivered to the CA prior to the Manufacturer's representative leaving the site. The CA shall incorporate the signed forms into the Contract file system.

Pre-Commissioning

The CA shall coordinate with the Manufacturer and Contractor to undertake Pre-Commissioning of the equipment. No Pre-commissioning activity shall take place on the Goods prior to receipt and review of the O&M Manuals. Once all pre-commissioning checks, run tests, and operating checks have been successfully completed, the Contractor and Manufacturer shall complete the Certificate of Equipment Satisfactory Performance form and submit to the CA. The CA shall file the Form in the Contract File system. Once the form has been signed-off, the CA will prepare a Certificate of Substantial Performance for the City Supplied Equipment Contract, initiating the Lien Holdback release period.

Commissioning

The CA shall coordinate the Manufacturer's representative attendance during Process Commissioning. Once process commissioning of the equipment has been completed and accepted the Manufacturer shall complete the Certificate of Equipment Satisfactory Process Performance form. Receipt by the CA shall signify Total Performance of the City Supplied Equipment Contract and initiate the start of the Warranty Period. The CA shall complete a Certificate of Total Performance and incorporate the signed forms into the Contract files.

Construction Inspection and Testing

The CA is responsible for ensuring that the Works are constructed in compliance with the Contract Documents. Inspection is the most common way to monitor contract performance.

Inspection is carried out by trained inspectors employed by or working for the CA, and may include independent testing and inspection organizations.

Where part-time inspection is employed, the inspector should carry out both scheduled and unscheduled inspections:

- Scheduled inspections are required to ensure that defects in the Work can be communicated to the Contractor's supervisory personnel who would be in attendance at these inspections. These inspections are typically associated with regular site meetings.
- Non-scheduled inspections, carried out at random or critical times during the course of the Work, are necessary to ensure that the Work is being carried out to the standards stated in the Specifications.

On-site Inspectors are responsible for ensuring that the Contract is being carried out in accordance with the Contract Documents. The Inspector's duties and responsibilities are usually included in the Contract Documents. In addition to ensuring that contract-specific conditions (e.g. site facilities and services, safety, security, clean-up, etc.) are met, the inspector's main role is to check conformance with specifications and the quantity of construction and notify the Contractor of unacceptable work or materials.

The inspector must have unrestricted access to the site. The inspector must have the right to reject materials or equipment delivered to the site which does not meet the quality requirements of the Contract Documents. This is particularly important where materials such as concrete or other products which have a non-reversible chemical process are incorporated into the Works. Preventing or stopping delivery of these types of materials before they leave the delivery vehicle will avoid costly removal by the Contractor at a later date. It will also allow the Contractor to return to the supplier and correct the condition. To ensure timely communication of the quality and quantity of work, the Inspector must have immediate access to the Contractor's senior supervisor on the Contract at all times.

Inspection and Test Plans

The CA shall obtain or prepare a detailed Inspection and Test Plan (ITP) based on the construction work. An ITP identifies the items of materials and work to be inspected or tested, by whom and at what stage or frequency, as well as Hold and Witness Points, references to relevant standards, acceptance criteria, and the records to be maintained. ITPs, when properly implemented, help ensure that, and verify whether, work has been undertaken to the required standard and requirements, and that records are kept.

The CA shall expedite and receive ITPs from City Supplied Equipment Vendors. The CA shall identify the need for FATs witnessing and inspections. The CA shall coordinate and arrange for appropriate inspectors to visit the manufacturing facilities at the appropriate hold points identified in the vendors' ITP.

The CA shall place ITPs and associated inspection reports in the Contract File and copies of the inspection reports shall be forwarded to the responsible design discipline for their review and acceptance.

Inspection

The CA shall perform or cause to be performed construction reviews throughout the duration of the Contract. The CA shall coordinate inspections performed by discipline specific individuals as required to ensure the Work conforms to the Drawings, Specifications and relevant codes. The CA shall also notify the PM of the planned Construction Review, facilitating the option for other City representatives to attend the Construction Review.

A Construction Review Record (CRR) form shall be completed by the reviewer. Copies of the CRR shall be filed in the appropriate file and a copy forwarded to the Contractor. Should any non-conformances be identified during the construction review, the CA shall record the items on a Non Conformance Report (NCR) form and transmit the NCR to the Contractor for action. The CA shall log the NCR in the NCR Log for tracking, monitoring and disposition. The NCR Log shall be reviewed and updated at regular Contractor Site Meetings.

Preconstruction Inspections

Claims by the contractor may occur for many reasons. For example, on street renewal contracts, the drainage facilities (e.g. curb inlets, catch basins, etc.) are usually cleaned prior to the commencement of the Work. Upon completion of the Work, the City will require that these facilities be returned to like condition if they are found to be otherwise. On other major City contracts, property owners may make claims for damages they attribute to the construction activity. Such claims are best addressed by carrying out a thorough preconstruction inspection of the Works.

The CA is responsible for ensuring that the preconstruction condition of existing facilities and properties adjoining the right-of-way or City-owned property are sufficiently documented to allow proper evaluation of any claims that may occur.

This typically involves compiling a detailed photographic record of the existing surface features within the public right-of-way or City-owned property, and by carrying out inspections of the City's underground facilities, as with the example on drainage facilities, with both the Contractor and appropriate City personnel present, prior to commencing the Work. Also, during preparation of this record, the exterior of all buildings and residences located adjacent to the site should be visually inspected for distress. Existing damage such as cracked windows, cracks in stucco exteriors and foundations, settlements, disrepair, etc. should be photographed or video recorded. When evaluating cracks in street pavements, sidewalks and private driveways, it may be beneficial to paint small cracks to enhance their visibility in the photograph or video.

On occasion, the CA may deem it necessary to examine the interiors of residences and businesses for damage prior to construction. This preconstruction inspection may be required where the proposed works require use of equipment which causes ground vibrations (e.g. pile driving, pavement breakers, etc.) and which are working close to any buildings. Examination of the interior requires that the owner grant entry to the building. The drawback to inspecting building interiors is that it is both time-consuming and costly.

Some consider the inspection as an invitation to claims, as the owners could view the inspections as the City setting a benchmark for damages to be incurred during the prosecution of the construction works. Measures must be taken during the design, tendering and construction of a contract so that the construction methods utilized do not unduly

distress adjacent buildings. Lastly, it should be noted by the CA that buildings are damaged over time by factors other than those which are construction related (e.g. soil swelling and shrinkage, weather, etc.).

Generally, post construction inspections are only made if a complaint or claim is received.

Testing

Arranging for testing is a prime activity to ensure the quality of the product. The quality assurance (QA) program will have been incorporated into the Specifications, and the quality control (QC) program) must be implemented and monitored by the CA.

On-site testing frequency and reporting is either pre-defined or established by the CA. The CA shall coordinate third party materials testing firms with progress of the work, receive and interpret test results, instruct the Contractor to propose corrective measures and review Contractor proposed corrective measures for acceptance.

The CA is responsible for maintaining complete records of the tests undertaken, their results and the action taken. Distribution of the test results to the three parties (City PM, Contractor and CA), the interpretation of the results, and recommended corrective action as required, is the CA's responsibility. Where test results indicate a significant defect in the Works, the CA is to advise the City PM of the problem and of the recommended action prior to ordering that corrective measures be undertaken by the Contractor. The CA shall file all test reports in the Contract File system.

Testing and certification of material or equipment fabricated off-site is often delegated to the Contractor. The CA may engage specialized inspection services to inspect and monitor the progress of critical off-site activities.

Defects

Defects identified by the CA are to be communicated immediately upon being discovered. The CA must provide written notice of the defects with instructions to the Contractor and retain records of the documentation for follow-up and Contract files.

Resolution of claims against the contractor for defects can be complicated by a number of factors, including:

- the potential involvement of a number of participants in sorting out the cause of defects;
- contract documents that fail to sufficiently define contract scope or design details;
- ambiguous or poorly drafted contract provisions; and
- extremely unilateral contract provisions

When disputes over defects arise, it often becomes evident that insufficient detail was paid at the contract outset in documenting contract obligations and in appropriately identifying and specifying relevant design and performance requirements amongst various project participants. These aspects are also high on the list of factors contributing to the difficulty in sorting out responsibility for defects.

Of key importance is the careful administration of the Contract in accordance with the requirements of the Contract Documents. Construction Contract Documents are, by their nature working documents, responsive to a wide range of traditional contract circumstances, as typically addressed in the GCs, covering a wide range of rights, obligations, procedures and requirements.

Progress Monitoring and Control

The CA shall prepare Daily Construction Reports (DCR). The DCR provides a chronological record of the Contractors progress including labour resources and equipment being utilized, safety records, activity reporting, forecasting, inspections and tests taken. Recording of daily construction issues raised and directions given to the Contractor should also be recorded in the DCR. The CA shall place DCRs in the Contract File's appropriate subfolder.

Request for Information

The Request For Information (RFI) form is the document used by the Contractor to request information or clarification related to the plans, Specifications or Contract requirements. RFIs are also used to request approval for minor contractual deviations that do not impact cost or schedule, and to obtain direction on how to proceed when there are conflicting Contract requirement.

Upon receipt of the RFI from the Contractor, the CA is to log the receipt and forward the RFI to the applicable design discipline for response. The CA shall log the response date and return the RFI to the Contractor for their action. If the RFI will have cost or schedule implications the CA shall undertake the Change Management process, and obtain a Project Record Index number (PRI) from the City PM if the PRI system is being used.

Contract Changes

Contract changes may be initiated by the City, the CA or the Contractor. There are numerous reasons for Changes in the Work to occur, including:

- Changed site conditions (e.g. unexpected soil variations or conditions discovered during alterations to an existing structure which were not disclosed in the Contract Documents and which could not have been discovered as part of normal site investigation when preparing the bid);
- Changes in external requirements (e.g. changes to building codes; where the City cannot obtain a permit to allow the Contractor to proceed with a portion of the Work, affecting the Contract Schedule or the manner in which the Contractor can carry out other phases of the Work);
- Changes in the scope of the Work by the City;
- Changes to allow for better, faster or more economical construction;
- Design errors (e.g. contradictions, discrepancies, inconsistencies, impossibilities, etc.);
- Discrepancies in the Contract Documents contradicting the intent of the Contract;
- Changes in market conditions (e.g. specified products become unavailable, new and products become available, new information becomes available which affects the choice of specified materials); or
- Final coordination of new construction with existing equipment (e.g. space changes, mechanical or electrical changes)

The CA must deal with the change request in a timely manner. The change process is described in the GCs and the PMM, Section 7.2.

All Changes must be fully documented including the reason for the change, technical details of the change, cost and schedule impacts, CA's recommendation for the Change and the formal approval.

Contemplated Change Notice

When a change in the Work is contemplated and time is available for identification and evaluation of the change, the CA shall compile all technical details supporting the contemplated change and create a CCN. The CCN then is processed through the change process identified in PMM Section 7.2.

Changes Order

Once the CA has received the City PM's authorization to proceed, the CA is to prepare a Change Order (CO), including references to the PRI, the CCN, date of Contractor's written quotation, value of change and impact on Contract Time.

The CA will obtain the Contractor's signature, confirming the Contractor's agreement to the Change in the Work and affix the CA's signature recommending the CO approval. The CA will then forward the CO to the City for signature and acceptance.

The CA shall file all change documentation in the Contract File.

Field Instructions

In cases where there is insufficient time to follow the formal change process, the CA has the authority to issue a FI, authorizing the Contractor to proceed immediately, in accordance with PMM Section 7.2

Cost Control

The premise of cost control is to know the complete financial status of a Contract at any given point in time during progress of the Works. Cost Control is a commitment based strategy that provides the City with early indication of estimated final costs for the Contract prior to final job cost accounting. A commitment based system means that no costs will be charged against the Contract unless there is a corresponding commitment authorization, in other words invoicing cannot exceed the committed value.

The CA shall prepare a Monthly Forecast Cost Report. The Monthly Forecast Cost Report will include a record of all commitments including the Initial Contract Price and CO, Progress Estimates coupled with a Forecast to Complete, and Estimated Final Contract Price.

The Estimate to Complete is an estimate of Known Unknowns (i.e. Outstanding CCNs, FWAs and pending claims) as well as a sum for Unknown Unknowns (i.e. Contingency).

The Forecast Cost Report is to be included in the Monthly Contract Status Report and include a variance report explaining changes that have occurred during the reporting period.

Over-Expenditure Analysis

When required, the CA shall provide analysis and documentation supporting Changes in the Work. The analysis and documentation will be used by the City as part of the Contract Over-Expenditure Report required by City of Winnipeg Administrative Directive No. FM-002.

Contractual Disputes

The GCs generally provide methods for resolving contractual disputes between the CA and the Contractor over the CA's valuation, measurement or change in Contract Time and/or Contract Price for the extra work. The methods are specific to the GCs that are applicable to the contract.

In most cases dispute resolution between the CA and the Contractor is as follows:

- If the Contractor disputes a determination made by the CA, the Contractor shall act in accordance with the CA's determination.
- The has the right to appeal a determination or order in accordance with the terms of the GCs. contractor

Claims Resulting From Extra Work or Diminution of Work

Claims resulting from extra work can be classified into the following categories:

1.0 The Contractor disputes the determination of the CA as to whether the Change in Work is extra work.
2.0 The Contractor disputes the CA's valuation of the extra work.
3.0 If the Contractor feels strongly that the value indicated in their quote for the extra work is fair and reasonable, they may appeal the CA's determination in accordance with the GCs.
4.0 There is no way for the Contractor or the CA to evaluate the effect of multiple Change Orders for extra works on the Contract at the time an individual Change Order is being priced (the "ripple effect").
5.0 Taken individually, the valuation of the Change Orders may appear reasonable; however, multiple Change Orders on a contract can potentially disrupt a Contractor's operations. For example, the Contractor may find that their original schedule for labour resources and equipment is subject to the demands of the extra work, and they may have to take personnel from "critical path" activities to complete the extra work. Or, the extra work may require supply of equipment or material which is not readily available and which prevents the Contractor from proceeding with the extra work and with previously scheduled critical activities.
6.0 While the Contractor may be positive that all the Change Orders have affected their productivity, the CA may consider that the Contractor was poorly organized and that their labour was uncoordinated; in short, that the Contractor caused their own problem. In order to evaluate the Contractor's claim, it is imperative that the CA have the Contractor document the events and activities that may have caused any delays or loss of productivity.
7.0 The Change Order(s) may extend the Contract Time. This may result in extra costs if the extended duration of the Contract takes the Work into late fall or winter, causing the Contractor to heat and/or hoard the Work, and with resulting productivity.
8.0 Extensions to the Contract Time may result in the Contractor facing new wage rate increases or material price increases.

Material variations in the scope of the Contract or in the Contract Time could result in the Surety being discharged from its obligation to the City under the Performance Bond. Where Change Orders result in these changes, the Surety must consent to such changes prior to undertaking the extra work.

9.0 The Contractor proceeds to perform extra work before receiving written authorization to proceed.

10.0 There is potential for a claim to be made by the Contractor if they are directed to proceed with extra work or a Change in the Work without written authorization. There may certainly be a dispute if the CA considers the extra work to have a lesser value than the Contractor. Also, such direction may have been given without fully understanding the effect of the changes on the operation or safety of the facility being constructed and may ultimately not be accepted by the City.

To qualify and evaluate all claims, it is important that the CA carefully document in the field all activities related to Changes in the Work. These should be included as a separate component of daily field reports.

Claims and Damages

This section illustrates the process for addressing Contractor claims during the course of the Contract, identifying the duties of the CA and the routing of the associated documentation.

Claims

Upon receipt of a claim from a contractor, the CA shall examine the justification for the claim, evaluate the merit of the claim within the context of the Contract documents, develop a recommended course of action and inform the City PM of the claim. The CA shall notify the City PM within 24 hours of receipt of a Contractor's Claim. The City PM shall log the claim in the RFI Log or as a PRI if the system is being used.

The following steps are to be undertaken by the CA:

1.0 The CA will gather pertinent information to verify the existence of a basis for the claim within the scope of the contract. Specifically the circumstances that gave rise to the claim and the principles on which the claim can be contractually considered.

2.0 The CA will evaluate the Contractor's assessment of their loss or delay. The CA will also evaluate the criticality of the affected tasks on the Contract Critical Path.

3.0 The CA will assess the causality of the claim. Integral to this shall be a review of any actions that could be reasonably expected that the Contractor should have undertaken to mitigate their losses.

Damages

If the CA makes a determination in favor of the Contractor's claim for damages, a recommendation is to be submitted to the City PM. Upon receiving authorization from the City PM, the CA shall prepare a CO reflecting the claim criteria and price and forward the CO with the CA's recommendation to the City PM for formal authorization. If the CA determines the claim has no merit, the CA shall issue a FI notifying the Contractor of the rejection of their claim with the basis for such rejection. If the Contractor does not agree with the CA's determination, the Contractor has the right to appeal the determination, as provided for in the GCs.

Delay Damages

It is important to recognize that timely completion of the Work does not depend solely on the behavior of the Contractor. The City PM and project team, and the CA also have contractual responsibilities which, if not met, can impede progress of the Work and result in delays for which the Contractor may seek compensation. Examples of delays in which the Contractor is not likely to be held responsible were listed previously in Section 6.2.

To be successful in a claim for delay under the above circumstances, the Contractor must prove that any change or delay was a risk which it had not assumed and that its reasonable reaction resulted in extra costs or damages.

Where a Contractor fails to comply with the Contract Schedule, the City may obtain damages for costs incurred as a result of the delay. The City is entitled to have the Work completed in the time specified. However, the Contractor will not be liable for excusable delays or for damages that are too remote. Some reasons that the Contractor could be held liable include ineffective supervision and direction of workers, labour disruptions, problems with Sub-contractors, and slow or incompetent work at any stage of construction.

On a contract, there is a duty for all parties - the Contractor, the City and the CA - to cooperate and not interfere with the performance of the other parties.

Interference with the Contractor's work by the City or the CA may take the form of not providing proper access to the site, inhibiting performance of the required work, dictating procedures or the order of work to be done after award of the Contract, or otherwise making the Contractor's job more difficult.

Third Party Bodily Injury or Property Damage Claims

During the course of a construction contract, motorists, homeowners or building owners may direct damage complaints to the City's initiating Department, a consultant CA, the Contractor or the City's Claims and Insurance Branch (Finance Department).

Once the initiating Department of the City is made aware of the damage complaint, the following action is to be followed:

- The CA informs the City PM of the complaint
- The City PM (or CA) directs any claimants to the City's 311 claims reporting line.
- The City PM advises the Claims and Insurance Branch of the complaint immediately that could lead to a claim. Failure to comply with reporting requirements may violate the insurance agreements and engage any access to insurance proceeds. All Claims are handled through the City's Claim Branch and assigned a City Adjuster.

First Party Property Damage Claims

During the course of a construction contract damage may occur to the structure being built or worked on. Once a loss occurs the following action is to be followed:

- City PM is notified of the loss
- City PM advises the CA of the loss
- City PM advises the Claims and Insurance Branch of the loss by phone at 204-986-2828 or at *claims@winnipeg.ca* within 24 working hours of the occurrence. Written notification should be supplied to the Claims & Insurance Branch within 7 days (1week). The information must be complete and accurate and should contain the information requested on the Property Damage, Theft or Loss Report. The Adjuster assigned by the Claims Branch will investigate and take appropriate photos or video of the damage. The Insurance Branch will advise the appropriate insurance companies of the loss.

Default by Contractor during Construction

The CA has an obligation to ensure that the contractor complies with the contract documents when undertaking the work. The CA has a further obligation to instruct the contractor to remedy any breach of its contractual obligations. If there has been a material breach of the terms of the contract, the CA must direct the contractor in writing to remedy the default and also send a copy of that direction to the surety. Examples of situations in which a letter must be written to the contractor and copied to the surety are:

- The contractor has failed to remedy, reconstruct, or replace faulty work or work that fails to meet contract requirements during construction as instructed
- The contractor has failed to follow instructions to remove and replace inferior materials (whether incorporated into the work or not) and material that does not comply with contract requirements during construction
- The contractor is not complying with the latest approved schedule of work
- The contractor disobeys or refuses to follow the CA's instruction to improve methods of work, to increase or improve the plant, or to employ additional or better qualified workers

If a consulting firm has been retained, the City PM should instruct the CA to document all breaches and to advise the PM immediately if a breach occurs.

Default by Contractor during Warranty Period

The CA also must inspect the contractor's work for defects and deficiencies and give the contractor notice if they occur, with an instruction to remedy them before the warranty period expires. The surety must be advised before the warranty period expires of any defects or deficiencies the contractor has not remedied, or the surety will be discharged from its

obligations under the performance bond. Inspections must be carried out well before the expiration of the warranty period to ensure the City can meet its obligations to the surety.

In conclusion, if any of the defaults described above occur either during construction or during the warranty period, the City PM is to notify the Legal Services Department immediately.

Manage Risks

Contract work is to be included in the project Risk Management Plan (RMP) as defined in the PDP. Risks identified in the risk register will have defined risk response owners established in accordance with PDP Section 5.8. The identified risks are to be managed in accordance with the risk response plans.

The City has established practices to manage certain types of contract risks, including insurance and bonding. The procedures to preserve the City's claim against the insurer are described in the following sections.

How to Preserve the Claim against the Insurer

The City has specific obligations to protect the claim against the insurer, as described below.

Liability Insurance Policies

Comprehensive or Commercial General Liability Policies and Contractor-Purchased Wrap-up Policies

The City requests to be listed as an additional insured or Named Insured on Contractor purchased liability policies. To protect the City's claim against the insurer, the City has an obligation, independent of the contractor who purchased the CGL or wrap-up policy, to put the insurer on notice immediately following receipt of advice that a third party has suffered bodily injury or property damage as a result or consequence of the contractor undertaking the work.

CAs therefore must be instructed to call the City PM who will notify the Claims and Insurance branches them of any such claim, including particulars, immediately after witnessing or being advised of the issue. The Claims branch will contact the contractor (specifically, an officer or director of the contractor) to advise the contractor of the claim and instruct him or her to request that the insurer be put on notice immediately after the Contractor is informed.

If the City or its representative does not serve notice of the claim on the insurer, assuming instead that the contractor will serve the notice, the insurer has the right to deny the City coverage on the claim if the contractor fails or elects not to notify the insurer.

Automobile Liability Policies

The City is not an additional insured on the contractor's automobile liability policies. Nevertheless, the CA should notify the City PM who will notify the Claims and Insurance branches if she or he is advised of or witnesses an accident involving one of the contractor's vehicles (including cars, trucks,) or any of the subcontractors' vehicles while they are undertaking the work to advise her or him of the incident, including particulars. The Claims supervisor in the Corporate Finance, Risk Management Division can investigate and write to the contractor to ensure that she or he has put the insurer on notice.

Architect and Engineer Errors and Omissions Policy

The City must inform the Claims and Insurance Branch if it becomes aware of an error or omission attributable to its architects or engineers that will or may result in a loss to the City.

The Claims or Insurance Branch will determine if there is Professional Liability insurance on file for the project and request that the architects or engineers put their Insurers on notice. If no insurance is available the Claims Branch will contact the Legal Services Department immediately and Legal Services Department will provide the architects or engineers written notice of the error or omission on behalf of the City.

Property Insurance Policies

Course of Construction or All Risks Builders Risk Course of Construction Policies

The City may be listed as an additional insured or Named Insured on these policies. Therefore, the procedure to follow is identical to the procedure outlined for comprehensive or commercial general liability and contractor-purchased wrap-up policies.

Contractor's Equipment Insurance

The City is not an additional insured on the Contractor's Equipment insurance policies. Nevertheless the CA should notify the City PM who will notify the Claims and Insurance branches if she or he is advised or witnesses an accident that damages City property or vehicle and involves one of the contractor's equipment (heavy trucks, loaders, graders) or any of the subcontractor's equipment while they are undertaking the work to advise her or him of the incident including particulars. The claims supervisor in the Corporate Finance, Risk Management Division can investigate ad write to the contractor to ensure that she or he has put the insurer on notice.

How to Preserve the Claim against the Surety

For the City to preserve its claim against the surety if the contractor defaults, the City must honour the terms and conditions of the bid and performance security and the law as it relates to them. If the City fails to honour these terms and conditions or acts in a manner that prejudices the surety's right to a contribution or an indemnity, the surety will be discharged in whole or in part from its obligation to the City under the performance security.

The following list describes examples of City acts or omissions that could result in the surety being discharged, in whole or in part, from its obligations to the City under the performance bond:

- Failure to Disclose Material Facts

  An example of failing to disclose material facts can be found in the leading 1937 Supreme Court of Canada case *Doe et al. vs. Canadian Surety Company,* in which the contractor had omitted bidding on two items totaling $13,000 in a $100,000 contract to build a church. The contractor attempted to withdraw his bid but was faced with losing his deposit. As a result, he proceeded with the work, ran into financial problems, and defaulted on the contract. The court held that the surety was discharged on the grounds that the owner did not disclose the two substantial bid omissions prior to the surety issuing its blanket performance security.

Material Variation in the Terms of the Contract

Material variations include a material change in the nature or scope of the work, overpaying or underpaying the contractor, and extending the contractor's time for completion without the consent of the surety.

1.0 Alterations in the Nature or Scope of the Work

The key word under this heading is "material." If the alteration in the work is so material that the contractor would no longer be performing the type of work described in the bid opportunity, the surety will be discharged.

2.0 Overpayment

If the City overpays a contractor, the surety may argue that the overpayment has prejudiced its rights by depleting the contract monies that would have been available to the surety to complete the work. Overpayment can take the form of premature payments, payment for faulty or defective work, or paying without deducting the required holdbacks.

3.0 Underpayment

Conversely, as the surety is entitled to the same defense as the contractor, if the City wrongfully fails to pay the full amount of the contractor's progress payments, the surety may be discharged from its obligations under the performance bond on the grounds that the City breached the contract by failing to make the required payments. Further, if the contractor becomes insolvent, the surety can argue that the City caused the contractor's financial difficulties and by doing so has prejudiced the surety.

4.0 Extending Time

By issuing a performance bond, the surety has agreed to guarantee the contractor's performance of the contract for the period of time specified in the contract. If the City extends the contract time for a reason other than the reasons permitted by the GCs without the consent of the surety, or incorrectly determines that the delay was beyond the control of the contractor, the surety can be released from its obligations under the performance bond.

Laches

"Laches" is a legal term involved when the City has omitted to do something it has contracted with the surety to do, or has failed to preserve some security or benefit to which the surety is entitled. If the City does not provide the surety with prompt notice of the contractor's default or faulty performance, the surety will definitely be discharged. The surety could also be discharged if the City neglects to call a contractor to account within a reasonable period of time after faulty performance (e.g., defective work) or default (e.g., failure to meet schedule).

Protecting the City's Claim against the Surety

The general rule to follow is "**if in doubt, notify the surety**."

The department's director and the City solicitor on the director's behalf are the only people authorized to contact the surety to:

- Obtain the surety's consent to materially change the work
- Put the surety on notice, by copy of the default letter to the contractor, that the director is taking the whole or part of the work away from the contractor (GC.8.04)

The individual directors have not delegated authority to the City PM or CAs to make the foregoing contacts. As a result, if the City PM or CA wants the contractor to undertake a material change in the work, or if the contractor's actions are so serious that they have resulted in a situation covered by the GCs, the City PM or director must contact the Legal Services Department immediately. Legal Services will prepare the required letters to the surety for the director's signature.

Liquidated Damages

Liquidated damages can only be applied to chargeable (non-excusable) delays. Chargeable delays involve situations which are the responsibility of the Contractor, and therefore do not entitle the Contractor to an extension of time or to any other compensation.

The maximum amount of liquidated damages is the amount as stated in the Bid Opportunity, regardless of the actual loss or damages. Liquidated damages become payable immediately upon breach and must be deducted from progress estimates payable to the Contractor.

When liquidated damages are deducted, the CA must fully document the decision, and the details of the deductions. The Contractor is entitled to a precise accounting of the actual loss or damages on a day by day basis.

It must be noted that time extensions do not constitute a waiver of liquidated damages. The extended dates for the phases of the Work and for the Substantial and/or Total Performance of the Work are merely substituted for the original dates without affecting the City's right to damages if the new dates are not met.

Start Up, Commissioning and Transfer

Commissioning and transfer takes place in the project management "transfer sub-phase" as defined in the PMM. The contract deliverables from this phase include items such as the O&M manuals, as-built drawings, and asset register updates.

Operating and Maintenance Manuals

Operation and Maintenance (O&M) Manuals may include manufacturer's operating and maintenance instructions, manufacturers' drawings, constructions drawings, shop drawings, catalogues, spare part lists, and photographs, all as necessary to operate and maintain the Works.

O&M Manuals are clearly required for the safe and effective operation of equipment. They are part of the Contract and Total Performance cannot be achieved without them. In fact, in many cases the Works are not ready to be used without O & M Manuals, that is, they are necessary for Substantial Performance.

The Specifications must outline what is required and the timing of the manuals, which will then create a contractual obligation for their delivery.

The final step in the Contract Implementation Stage involves completion and submission of "as-built" record Drawings for the Contract, as well as a "Final Construction Report" and all applicable design notes and shop drawings.

Training

The CA is responsible for coordinating the training at the job site. The CA will receive and review lesson plans submitted by the Contractors and forward them to the operating units for review and comment. The submittals shall be tracked via the submittal procedure.

The CA, in concert with the City PM, City operations, Contractors and Equipment Vendors, will develop the training schedules for both classroom and field level training.

The CA shall prepare a Training Session Log of all training sessions. A Certificate of Satisfactory Classroom Training identifying the component training and sign-offs signifying completion and acceptance for each session, is to be prepared by the CA and recorded on the Training Session Log. A Certificate of Satisfactory Field Training identifying field training and sign-offs, will also be recorded on the Training Session Log.

When required the CA shall coordinate video recording of the training sessions by City designated videographers.

Operation between Substantial and Total Performance

In some cases the specifications will require all or a portion of the completed work to be placed into service after Substantial Performance but before Total Performance. For these situations, the specifications will identify the documentation and training required for the City to assume responsibility, and responsibilities for the cost of operations and warranty obligations during the interim period. The CA will be responsible for advanced arrangements and proper allocation of responsibilities and cost during this interim period.

In the case of treatment works, it is to be made clear that the Contractor is obligated to operate the Work and that the City is operating the Works under the "guidance and direction" of the Contractor. The Contractor has responsibility for faults, even those caused by actions of City personnel. This is especially advisable where training, operating and maintenance manuals still have not been delivered by the Contractor.

As-Built Drawings

A primary responsibility of the CA is to accurately document all changes that have occurred throughout the course of construction on a contract, and to produce accurate "as-built" Drawings for contract record purposes.

These as-built Drawings become the description of the Contract after construction, which invariably is somewhat different from the design drawings. Typically, in consulting contracts, as-built Drawings are required within one month to three months of total performance of a contract. The CA should ensure that the as-built Drawings are complete in the time frame specified in the consulting contract.

The Specifications require that the Contractor to supply information on any deviation from the Contract Drawings for the purpose of preparing the as-built Drawings. These are to be turned over to the CA as each section of the Work is complete. Foundation as-built Drawings should be turned over immediately after foundation work is complete, before the foundation Sub-contractor leaves the job. This level of attention to as-built drawings throughout the Contract will ensure that the as-built Drawings are accurate at the end of the project.

As-built must be produced in accordance with City drawing standards. Commissioning

The CA shall be responsible for coordinating implementation of the Commissioning Plan as defined in the specifications. The CA will coordinate contractors' commissioning efforts in relation to the Commissioning Plan, which in some cases may involve consulting staff, the use of a new sub-contractor, or even a new contractor.

The CA shall place all pre-commissioning tests and documentation completed by Contractor in the Contract File.

Final Construction Report

The final Construction Report provides complete documentation of all aspects of construction on the Contract, including a complete photographic record.

Included with, or attached as separate Volumes, can be such contract-specific documentation as may be required by the, as follows:

- A detailed Design Notes including such items as structural and hydraulic design calculations;
- A detailed Operational Template describing the intended operation of the system, and referring to the O&M Manuals received from the Contractor
- Related Shop Drawings (reviewed and accepted "final" copies).
- Equipment Manuals
- Details and copies of any extended (product or equipment) Warranties provided in accordance with the Contract Specifications by the applicator, manufacturer, supplier and/or Contractor.
- Service records, video inspections, other contract record information

Progress Payments

This section describes the CA's responsibilities for Progress payments made to the Contractor during the course of the Contract.

Progress Payments

Progress payments are to be made in accordance with the terms of the contract. Typical terms of payment for construction contracts are as follows:

- The CA shall prepare a Progress Estimate based on the value of the Work performed during the preceding month:
  - A completed progress estimate is to be submitted to the City PM by the fourteenth Calendar Day after the end of each month, or as soon thereafter as possible, subject to receipt of all necessary information from the Contractor by the seventh Calendar Day after the end of the month.
  - The CA shall also ensure **reasonable amounts** are withheld for deficient work. The retention holdbacks and holdback releases must be indicated on the Progress Estimates. Retentions that set off deficiency works can be paid out to the Contractor when the corrective measures have been reviewed and accepted by the CA. (Holdbacks for uncompleted work may also apply in some cases, but are not normally required since no payment should have been made for uncompleted work)
  - The progress estimate shall be structured in accordance with the bid pricing. Line item breakdowns may be used for cases such as lump sum contracts where greater detail is required on progress and payments, but must roll-up to the contract price.
  - The progress payments are to include those for sub-contractor work, since the City does not contract directly with sub-contractors.
  - It is the CA's responsibility to certify progress of the Work and the payment valuation
- All approved COs shall be listed on the Progress Estimate with applicable progress valuation. The CA shall attach copies of all COs being progressed during the period.
- Progress Estimates must reflect Statutory Holdbacks, Holdbacks to Date and Holdback Releases.
- The CA shall apply Statutory Holdbacks to all Interim Progress Payments in the amount stipulated in the Manitoba Builders Lien Act.
- Once Substantial Performance has been achieved, as defined in Section 12.0, the CA shall prepare a Release of Holdback Progress Estimate identifying the payable date, as the end of the 40 day Lien expiry period. The CA shall also retain Lien Holdbacks on Progress Estimates submitted during the period between Substantial Performance and Total Performance. The release of these holdbacks shall be triggered on the Date of Total Performance and paid at the expiry of another 40 day Lien Period
- Lien Holdbacks cannot be utilized to set off the cost of deficiency corrective measures should the Contractor abandon the Work.

A requirement to report the value of MRST included in the Progress Estimate may apply for manufactured goods within the Province of Manitoba. The CA shall ensure the Contractor identifies applicable MRST on the Progress Estimate. In the

case where the Contractor is an Equipment Supplier that is not registered as a Manitoba Vendor, the CA shall self-assess the MRST value and indicate same on the Interim Progress Estimate. MRST reporting requirements are as set out on the City of Winnipeg's Materials Management website.

Substantial Performance

The CA is responsible for retaining and releasing Builders' Liens Act holdbacks, and for issuing a "Certificate of Substantial Performance" on contracts and, where requested on sub-contractors. The Act provides for a holdback on contracts of 7.5% of the dollar value of the Work. This money and earned interest is held in trust by the owner. In effect, this holdback serves to formalize the process of dealing with the Builders' Lien Act. The holdback also protects the owner, ensuring that Sub-contractors and workers are being paid, avoiding a registered lien.

"Substantial Performance" is defined under the Builders' Liens Act, and accordingly must be used in administering a contract.

Builders' Liens Act

The Builders' Lien Act is complex and it is risky summarizing it. The Act is intended to protect the interests of contractors, sub-contractors, workers and suppliers, so that each is paid for their work on a contract. It lays out the responsibilities of owners and contractors and the procedures for making a claim (lien) for payment of money owed.

The definition of "Substantial Performance" and the requirements for holdbacks should be obtained from the most recent version of the Builders' Lien Act. The clause that has historically been in place is as follows:

Substantial Performance:

2(1) For the purposes of this Act, a contract or sub-contract shall be conclusively deemed to be substantially performed when:

(a) the structure to be constructed under the contract or sub-contract of a substantial part thereof is ready for use or is being used for the purpose intended or, where the contract or sub-contract relates solely to improving land, the improved land or a substantial part thereof is ready for use or is being used for the purpose intended; and

(b) the work to be done under the contract or sub-contract is capable of completion or correction at a cost of not more than

(i) 3% of the first $250,000.00 of the contract price,

(ii) 2% of the next $250,000.00 of the contract price, and

(iii) 1% of the balance of the contract price.

The Act also lays out the deadlines for registering liens, after which, the City need not be concerned about a lien. Under the Builders' Lien Act, holdbacks must be retained for 40 days after Substantial Performance (or Total Performance for work after Substantial Performance). This corresponds to the period within which a lien must be registered.

In the event a lien occurs, the City's obligation is to put the holdback account into court, asking that the liens be vacated.

If a lien occurs on a contract that you are working, in all likelihood you will hear about it from the Legal Services. The Legal Services will instruct that no further progress payments be made until a resolution is made.

If you get a question from any person working on the job about the Builders' Lien Act or if anyone on the Contract complains that they are not being paid for their work, don't give any advice. Suggest that they contact the Legal Services or their own legal counsel.

As a consequence of previously discussed clauses with respect to Builders' Lien, Risk, Liquidated Damages, it is obvious that the CA should issue the Certificate if and only if Substantial Performance is achieved. In other words, the CA should take the Certificate very seriously.

"Substantial Performance" on a Sub-Contract

The Builders' Lien Act contains sections whereby holdbacks can be released and paid on sub-contracts that are complete. This occurs when a Sub-contractor requests a Certificate of Substantial Performance for a sub-contract, in advance of Substantial Performance of the Work. The example often used is completion of a foundation sub-contract. The Builders' Liens Act allows for this. Accordingly, more than one Certificate of Substantial Performance may be necessary on a contract.

The Contract may make many references to Substantial Performance as a trigger dates. The CA should refer to the specific contract to confirm how the Contract has been written:

- The City takes over risk at the point the Contract is put to use. This makes sense, since the City is using the Contract. So for example, if a fire damages a building after Substantial Performance and before Total Performance, the City is at risk.
- Contractor is normally expected to remove any products, tools, construction machinery and equipment not required for the performance of the remaining Work.
- Substantial Performance can be the trigger date with respect to liquidated damages.
- Commencement of the Warranty may commence (as an alternative to Total Performance).

Determining Substantial Performance

The CA shall determine if and when Substantial Performance is achieved and shall certify the date thereof.

When the Contractor is of the opinion the Work of their Contract has been substantially performed, they shall notify the CA requesting arrangement of an inspection of the Work. The CA shall arrange an inspection with the applicable engineering discipline inspectors, City representative and the Contractor. The CA shall review the outcome of the inspection in context with the Builders' Liens Act and certify whether Substantial Performance of the Contract has been achieved.

In cases where correction of deficiencies is restricted by climatic or seasonal conditions, the CA can issue Substantial Performance of the Work. In these instances, the start of the Warranty Period on the completed works only will begin 30 days following the Date of Substantial Performance. Documentation to this effect must be saved in the Contract File.

When the CA determines the conditions of Substantial Performance have been achieved, a Certificate of Substantial Performance must be completed with the required signatures, available from the City's website at: http://www.winnipeg.ca/matmgt/templates/contract_administration/Contract_Administration_forms.stm

The CA shall forward a copy of the signed Certificate of Substantial Performance to the Contractor to prominently display at the contract work site as notice to Sub-contractors and suppliers of the Contract Completion status. Copies shall also be forwarded to the City PM, included with the progress payment and included with Contract File.

Total Performance

Total Performance means that the entire work, except those items arising from the provision of Warranty items, have been performed in accordance with the Contract. Removal of all temporary services for construction including but not limited to site trailers, storage facilities, restoration of laydown areas and debris removal are complete. There can be no deficiencies or defects in the Works apparent at Total Performance. If you certify Total Performance and there are deficiencies, you will likely not be able to bind the Surety in respect of those deficiencies, unless they are identified to the Surety and on the Certificate of Total Performance in a manner acceptable to the Legal Services.

The Total Performance Date may initiate the start of the Warranty Period, but may have extended durations as further specified in the SCs or Contract Specifications. The CA with the City PM and Contractor shall complete a final inspection to certify the Date of Total Performance.

Total Performance is also of importance in the Builders' Lien Act, in that it triggers another 40 day period for holdbacks on work done since Substantial Performance.

Total performance also triggers the end of the period for Contract Changes. Since the Work is finished, the City and or Contractor no longer have the right to issue a Change in Work.

Certificate of Total Performance

The Certificate of Total Performance is to document that Total Performance has been reached on the Contract.

The CA shall prepare the Certificate of Total Performance, available from the City's website at: http://www.winnipeg.ca/matmgt/templates/contract_administration/Contract_Administration_forms.stm

Copies of the completed Certificate of Total performance shall be sent to the City PM, Contractor and Contract File system. The Certificate of Total Performance should include a statement indicating specifically what warranties begin at Total Performance, or if warranties on some of the Work began earlier. The Certificate of Total Performance must not be signed if there are deficiencies, since certifying Total Performance releases the Surety for all but Warranty Items.

Warranty

The Warranty Period shall begin on the date specified in the contract, and extend for the duration specified in the contract. Extended warranties may remain in effect for specified items, usually specific to a product or manufacturer, and include a separate warranty certificate that will be maintained and managed by the City.

Once the Contract has been Totally Performed (or at the date stated in the SCs for commencement of the Warranty Period), the CA is responsible for providing inspection services during the Warranty Period. The CA is responsible for making regular visits to the site to inspect for defects in the completed Works.

Warranty Defects

The CA shall notify the Contractor in writing of any observed defects or deficiencies which are categorized as warranty items. The Contractor shall remedy all defects or deficiencies identified on the notice to the satisfaction of the CA within the time period specified on the notice.

The Contractor is responsible for maintaining the Works during the course of the Warranty Period, as stated in the GCs. The Certification of Acceptance shall not however relieve the Contractor from their responsibilities for any breach of Contract including but not limited to, defective or deficient work appearing after the date of Acceptance.

In the event that defects become apparent, the CA is to evaluate the defect(s) in terms of:

- define the defect;
- determine whether the cause of the defect is obvious, and testing and investigations that may be required to determine/confirm the cause of the defect;
- begin a monitoring program to determine the extent of the defect and whether the defect is getting progressively worse; and
- determine whether there is a correlation between the defect and the data gathered during the course of the Contract (e.g. test results, weather, etc.).

With the available information at hand, the CA is to immediately advise the City PM of the defect(s) and their proposed resolution of the defect(s). Upon getting concurrence of any proposed action by the CA, the CA shall forward to the Contractor appropriate Notice from the City to correct the defect(s).

At this point, the Contractor is fully responsible for correcting the defect(s). In the event that the Contractor cannot or does not meet their obligation to correct the defect(s), the City may take appropriate action to correct the defect(s).

(NOTE: Prior to the City proceeding to undertake the remedy with its own forces or by another contractor(s), the City's first step is to advise the Contractor's Surety of the failure of the Contractor to remedy the defect and allow the Surety the choice of assuming the obligation to undertake the Work to remedy the defect. Only the Director, not their designate, can send Notice directly to the Surety.)

The intent is that the Contractor is responsible for correcting all defects evident during the Warranty Period, and is obliged to correct same upon receiving notice from the City. In the event that the Contractor disputes that they are responsible for the defect, they are responsible for providing proof to support their claim.

In the event that there are unresolved defects as the end of the Warranty Period approaches, the Surety must receive Notice from the Director, as noted previously in Section 15.2.1, of the defects prior to the end of the Warranty Period, in order to preserve the City's right to claim against the Surety in the event of default by the Contractor.

Certificate of Acceptance

Prior to expiry of the Warranty Period, the CA shall arrange an Acceptance inspection with the Contractor and City representatives to identify any outstanding warranty issues.

The Contract only terminates at the end of the Warranty Period, or upon successful resolution of any Warranty Defect disputes, whichever is the latter. As of the date of the Certificate of Acceptance, the Contract shall be considered to be terminated. In no case shall the Performance Security be released, or allowed to lapse, prior to successful resolution of all disputes and/or correction of all Defects.

If the work has been completed in compliance with all requirements of the contract, the CA shall certify acceptance of the work, in accordance with the GCs. The CA shall prepare a Certificate of Acceptance, available from the City's website at: http://www.winnipeg.ca/matmgt/templates/contract_administration/Contract_Administration_forms.stm for signature of the City PM and Contractor. Copies of the completed Certificate shall be sent to the City PM, Contractor and Contract File system.

References and/or Resources

Title	Description	Document Location

Project Management – Change Management Procedure

Procedure #	
Description:	Outlines the steps for a Project Manager to manage change in an organization

Overview

Objective

To ensure that organizational change is managed in a consistent manner on all projects.

Roles, Responsibility and Authority

Role	Responsibility	Authority
Project Sponsor	To validate that a change plan is included in the PDP and check progress at specific milestone events during the project lifecycle.	
Project Manager	Develop a change management plan and execute the plan.	
Change Manager	Support the PM in developing the change management plan in the PDP and lead specific elements as defined.	
Care & Control Owner (receiver of the product or service)	To provide a champion from within their organization to lead the group that is impacted by the change.	Has the authority to direct resources within the service area being impacted.

Procedure Details

Document Revision No.	Revision	Date Released	Released By:

Introduction

Change management refers to the management of *organizational* change and as such, should not be confused with *change control*. Change management is a discipline which offers a structured approach that is aligned with the Project Management Institute (PMI) project delivery lifecycle. The purpose of change management is to promote and enable the adoption of changes that may occur as the result of project delivery, and thereby to support the achievement of project results and outcomes.

The City of Winnipeg has certified change managers located in every department who form a Change Management Working Group sponsored by the CAO. This group is a change management resource pool for projects. Its members are trained to apply tools and methods for change management within the change lifecycle framework.

Project managers should know who their departmental change managers are and should engage them in all the Phases of the project lifecycle. For a list of departmental change managers, refer to the distribution list in MS Outlook, CITY-ADKAR-Change-Managers, or contact the Manager, City Asset Management Program.

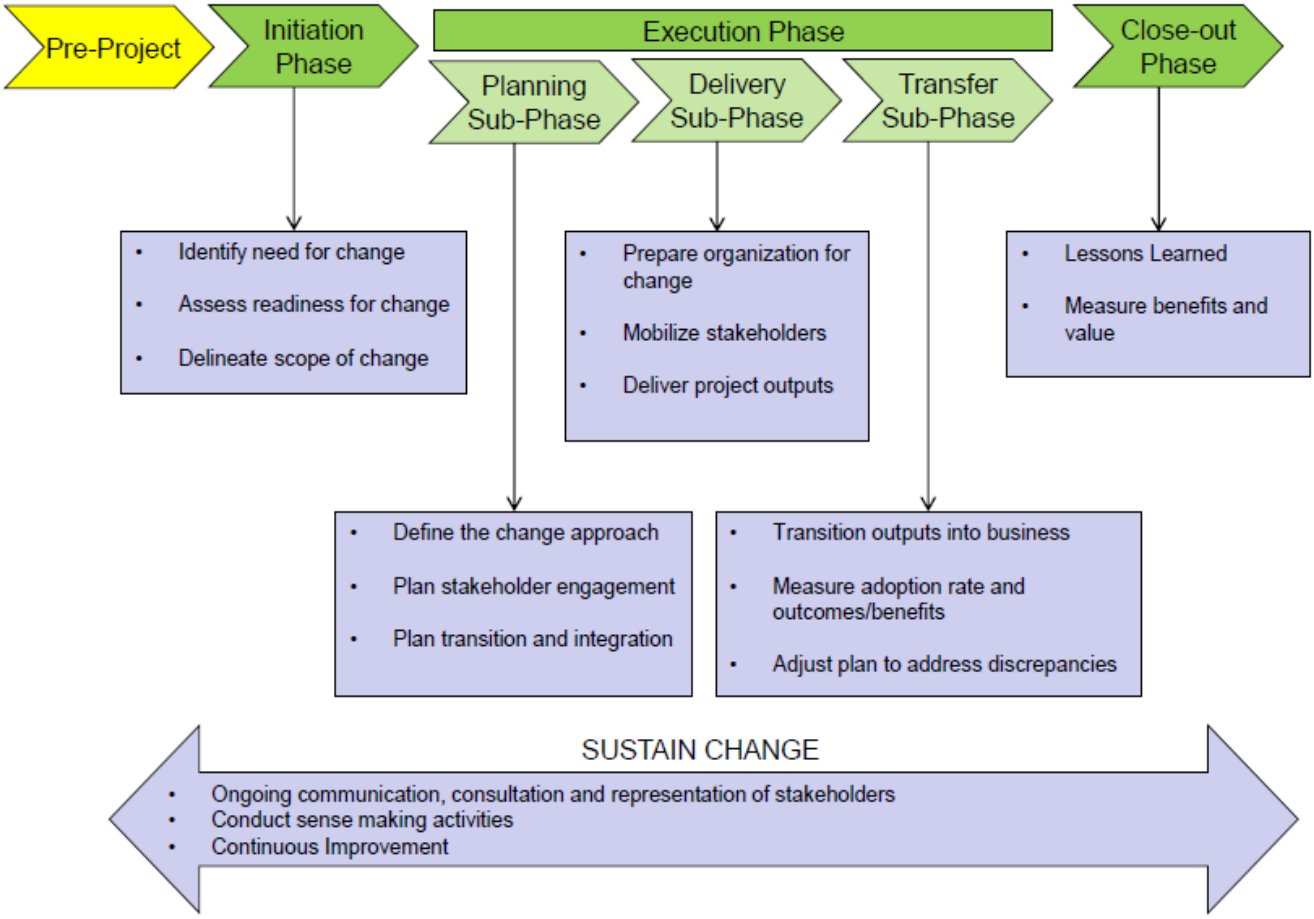
The Change Management Framework

The PMI recognizes that change management is an important feature of project management and successful project delivery. Without attention to change management, less than 40% of projects are successful. Thus, the inclusion of change management activities within the project delivery model is essential for minimizing barriers to change and for ensuring rapid and effective implementation of project outcomes.

The Change Management Project Delivery Process below depicts the Change Lifecycle Framework that should be used for City of Winnipeg project delivery. Details for each phase are described in this procedure. The change lifecycle framework is based on *Managing Change in Organizations: A Practical Guide* (PMI, 2013b) and is therefore consistent with PMI practices.

Figure 1 Change Management Lifecycle Framework

Change Management Procedure



Initiation Phase

This section identifies the change management activities within the Initiation Phase of the project delivery model. At this point in the project delivery lifecycle, the Project Manager should be aware that change management needs to be included in the Project Charter and in preliminary planning. Project sponsors should be informed that the project will feature change management expertise and deliverables throughout the project delivery lifecycle.

Identify the Need for Change

The PM should work closely with the Change Manager (ChM) to ensure that the business case and project charter are fully understood. As a minimum, the ChM will need to review the business case and project charter to understand the need for change. This is a necessary prerequisite for assessing the organization's readiness and for defining the scope of the change. The ChM will provide feedback on the content of the charter, for example, to ensure that the charter acknowledges the need to include change management effort within the project.

Assess Readiness for Change

The ChM will conduct an organization readiness assessment to assess the organization's capacity for change based on change characteristics of the project, the organization's history of adapting to change, sponsor evaluation, identification of change agents and stakeholders, etc. Depending on the nature of the project, deliverables may include a formal readiness assessment, a gap analysis and risk assessment, high level change management and communication strategies, a sponsorship engagement model, and change management team model. Deliverables may be used by the project team to communicate with project sponsors.

Delineate the Scope of Change

The ChM will delineate the scope of change from the review of the business case, the charter and in consultation with the project manager. Factors such as the number of employees affected by the project, the impact on processes, the need for process changes, etc. will need to be known in order to develop a coherent change management strategy and plans. The PM should be prepared to gather relevant data for the ChM. The data may be included in readiness assessment reports/deliverables.

Execution – Planning Sub-Phase

Planning is the strategic part of the project management cycle. Its final result is the project management plan that sets the framework for the rest of the cycle. Organizational change is a process of transforming an item or process from its current state through a transitional period to a future state. In the planning phase the subjects of the change are operating within the current state. At this point in the project, it is important that the sponsor ensures that stakeholder requirements are well defined and addressed and that good change management practices are embedded in the project plan. This section describes the planning activities and deliverables typically conducted by the ChM in the Planning Sub-Phase of the project delivery process. It is important in this phase of activity that the PM maintain a close working relationship with the ChM in order to understand the change management work that needs to be embedded within the project plan.

Define the Change Approach

An approach based on the assessments and analysis and high level strategies developed in the Initiation Phase will address the ways in which stakeholders will be informed, educated and trained about the change. The change approach will also identify the model and structure for the change management team. This is important because not all projects and changes are the same – the ChM will define an approach that is appropriate for the project. Deliverables include coaching and training plans, sponsor roadmaps which identify sponsor engagement requirements throughout the project, and mitigation plans that address barriers to change. These deliverables should be included in the PDP.

Plan Stakeholder Engagement

Stakeholder engagement is needed to provide complete, accurate and consistent information about the project and the change. The CHM will work with the PM and sponsors to develop a communication plan that describes what messages

regarding the change need to be communicated to stakeholders. The plan may be a separate deliverable or the messaging might be included in the project's communication plan. The PM should consult with the CHM throughout all the project execution phases to ensure that change management communication issues are addressed during project delivery.

Plan Transition and Integration

It is well known that change is perceived as difficult. The purpose of this phase is to assist stakeholders understand that the transition to the future state is temporary and that the future state will address deficiencies that exist in the current state. The role of the ChM is to develop a transition management strategy as part of the change management plan. The strategy is intended to help stakeholders understand the need to abandon the current state that it is important to manage difficulties associated with the transition in order to realize the benefits of the future state.

Execution – Delivery Sub-Phase

During the Delivery Sub-Phase, the change process moves into a transitional state where the changes effected by the project begin to be realized within the organization. Groups and individuals may need to change the way they perform tasks, for example, and this may increase stress levels and anxiety. Communication to increase awareness about the change, and training and coaching programs to prepare those affected by the change are important activities in the Delivery Sub-Phase.

The following section outlines the ChM's role in taking action and implementing the plans that were developed in the Planning Sub-Phase. The primary role will be to work with the project team to ensure that change management products and outcomes are delivered in such a way as to support successful project delivery.

Prepare Organization for Change

The ChM will ensure that change management plans are implemented so that employees are aware of the change and that they are aware of what training and coaching will be available to ensure that they have sufficient knowledge and ability to adapt to the future state. Preparing for change also involves ensuring that the right training and coaching is delivered to the appropriate groups and individuals.

Mobilize Stakeholders

The ChM will typically act as a coordinator to mobilize stakeholders by monitoring and coordinating ongoing communications that create and sustainment awareness and to monitor and coordinate access to training and other programs that are developed to assist the adaptation to the future state. The CHM will be assessing adaptation to change, looking for gaps and points of resistance in order to transform resistance into support for desired project outcomes and benefits.

Deliver Project Outputs

The ChM will use change management tools and expertise to assist the PM deliver project outputs through higher levels of adoption and usage.

Execution – Transfer Sub-Phase

This section describes the typical activities undertaken by the ChM in the Transfer Sub-Phase. Many of the change management activities that were undertaken in the Delivery Sub-Phase will continue in the Transfer Sub-Phase. Additional activities include collecting and analyzing feedback about the change (e.g. go-lives, cutovers) and involve collecting data to evaluate training programs, preparedness, analyzing change management effectiveness, etc.

Transition Outputs into Business

During the time that the outputs of the project are transitioned into the future state environment, the ChM will diagnose gaps where adaptation is lacking and needs additional change management support. Deliverables may be gap analysis, risk mitigation plans, compliance audits. The ChM may also develop action plans for enabling sponsors and coaches to sustain adoption of the change in situations of resistance.

Measure Adoption Rate and Outcomes/Benefits

The ChM will need to evaluate the effectiveness of change management to assess the adoption rate to the change. The ChM will determine if change management plans need to be adjusted or augmented to ensure that stakeholders have the knowledge and ability to adapt to the change.

Adjust Plan to Address Discrepancies

The ChM will implement actions necessary to move successfully out of the transition phase and into the current state by addressing any gaps that are identified. Deliverables may include corrective action plans for areas where adoption to the change is more difficult to sustain.

Close-Out Phase

This section describes the change management activities during the project close-out phase.

Lessons Learned

The ChM will participate with the project team in evaluating the effectiveness of change management in the project delivery process.

Measure Benefits/Value

The ChM will measure the benefits and value of change management to the project.

Sustain Change

Sustaining change involves a set of ongoing activities that begin at Initiation, continue through Execution and continue into sustainment after the project closes. Typically, these activities include:

- Ongoing communication, consultation and representation of stakeholders;
- Conducting sense making activities – defined in *Managing Change in Organizations: A Practical Guide* (PMI, 2013b) as "conversational and social practices that enable individuals and groups to make sense of what is happening around them";
- Assessments and actions for continuous improvement.

PMs should consult with ChMs for advice on reinforcing change through effective communications, organizational assessment, and strategies for sustaining change after project completion.

References and/or Resources

Title	Description	Document Location

Project Management – Record Management Procedure

Procedure #	Draft
Description:	Outlines the processes and procedures to manage records (documents) on a project

Overview

Objective

To provide consistent governance, procedures and processes to manage the records produced on a project.

Roles, Responsibility and Authority

Role	Responsibility	Authority
Project Sponsor	Provide record management quality assurance and control on the project.	
Project Manager	To ensure the project team follows the Record Management System procedure.	
Contract Administrator	To follow the procedure.	
Care & Control Owner (receiver of the product or service)	To follow the procedure.	

Procedure Details

Document Revision No.	Revision	Date Released	Released By:

Introduction

The following procedure outlines the Record Management System to be followed on all projects. This procedure supplements and builds on section 5.7.5 Plan Record management in the PMM.

The Record Management System is based on the five major stages in a record's life cycle:

- **Creation –** Information is generated or received and gathered into a record.
- **Distribution and Use –** The record, along with other information, is distributed among the project team on the project based on the PMM and specific requirements identified in the PDP.
- **Storage and Maintenance –** The records are filed using a logical and defined scheme into a managed repository, available for retrieval by authorized project team members. The records management system must maintain the integrity of the records, facilitate backup, and help users file and retrieve information.
- **Retention and Destruction –** Depending on the nature of the record, it is destroyed or retained for a defined period of time.
- **Archival Preservation –** Records that have a sustaining utility exceeding storage costs are preserved permanently in an archive.

Creation

Document Creation and Approval

- Create document and ensure that it is paginated (e.g. Page 1 of 4).
- Documents must contain the date of issue. Documents to be used for ongoing reference (e.g., SOP's Manuals, etc.) and administrative procedures shall also contain a date of when the document is to be reviewed.
- All documents must contain a "revision control" section to record all changes made to documents.
- Attach metadata tags according to the Metadata Requirements procedure (future).
- Store the document according to the Record Management System library structure (below).
- All documents must be legible, identifiable and made accessible to defined project team members and stakeholders.
- Electronic document creators are responsible for incorporating new or revised documents, and keeping their documents updated and accessible.
- It is the responsibility of the document creator to remove any obsolete or uncontrolled documents from points of use.

Documents of External Origin

- It is the responsibility of the Project Manager or Contract Administrator on contracts to identify and maintain documents of external origin.
- Documents to be used for ongoing reference (Project Deliverables) must be submitted to and approved by the Care & Use owner or their designate.

Distribution and Use

Making Copies of Documents

- Project team members may make uncontrolled copies of documents for short-term use (less than 30 days), audits, or proposed revision.
- These copies must be discarded after use.
- Document creators (holders) are responsible for incorporating new or revised documents, and keeping their documents updated and accessible.
- It is the document creator's responsibility to remove any obsolete or uncontrolled documents from points of use.
- Uncontrolled copies of documents, may be issued to organizations, customers, contractors, consultants and suppliers in paper or electronic form at the discretion of the Project Manager or Contract Administrator. These copies are to be stamped "UNCONTROLLED COPY."

Obsolete Documents

- It is the responsibility of project team members to destroy uncontrolled or obsolete documents found in their work areas.
- Any obsolete document not destroyed, for historical purposes, shall be clearly stamped on paper copies or marked in the footer of electronic documents "OBSOLETE DOCUMENT" to prevent unintended use.

Revisions to Documents

- The document owner must ensure that a revision number, date of revision and the name of the person who approved the document is on all revised documents.
- The nature of changes within revised documents maintained for ongoing use shall be clearly indicated in the "Revision Control" section at the beginning of each document. Details of all revisions must be maintained in in the Revision Control section as shown below:

Document Revision No.	Revisions	Date Released	Released By:

Storage and Maintenance

Document Library

The following section outlines where to store/file the project record. There are many documents generated throughout the course of a project, each document type is unique and may occur only once whereas some document types will be created numerous times. Some documents will be support/background documents for other project documents and will be linked accordingly. The document system in addition to the library and document folder design will be controlled through the use of Metadata tags (future).

Library Access Control

Access to the libraries will be secure and controlled by the Project Manager. For large projects a Document Administrator will assist in developing an access protocol.

Library Structure

The following library structure is to be established for each project. The preferred environment for this is SharePoint however each Department needs to assess their ability to access this environment.

- Project Delivery and Management
- Contract Administration
- Procurement
- Project Financials
- Project Development
- Public Engagement/Communication
- Project Safety and Security
- Project Transfer Documentation

A document folder may be created for each of these documents types depending on the size of the project.

Below is the document folder structure within each library.

Project Delivery and Management

- Business Case
- Background Information
- Risk Management
- Project Advisory Committee
- Project Delivery Plan
- Regulatory Information
- Project Schedule
- Briefing Notes

Contract Administration

A document folder should be created for each Contract Bid. This folder is intended to include a contract with consultants, as well as contractors.

- Insurance and Bonds
- Shop Drawings
- Contract Work Schedules
- Progress
- Billings
- Change Record
- Progress Meeting Minutes
- Field Instructions (FI)
- Nonconformance Reports
- Acceptance Tests
- Progress Photos
- Contract Legal
- Certificates of Substantial Completion
- Total Performance
- Request For Information (RFI)
- Proposed Change Notice (PCN)
- Authorization for Contract Change
- Claims
- Over Expenditure Report Analysis
- Daily Construction Reports
- Daily Inspection Reports
- Material Testing Reports
- Third Party Test Reports
- Contractor Safety Records (Near Miss, Incident, Infraction, CS/HW/CL Permits, JHA's, PSI's)
- Performance
- Verification Tests
- Deficiency Lists
- Final Acceptance

Procurement

A document folder should be created for each Bid Opportunity.

- Bid Solicitation Documents
- Addenda
- Bid Award Report (Recommendation)
- Staff Augmentation Request

Project Financials

- Basis of Estimate (BOE)
- Payment Transactions
- Project Cost Reports
- Tangible Capital Asset (TCA) Information
- Capital Budget Estimates
- Operating Budget Estimates
- Over Expenditure Reports

Project Development

A document folder should be created for each Bid Opportunity.

- Studies and Assessments
- Conceptual/Preliminary/Detailed Design Documents
- Configuration Roadmaps
- Issue Log and Supporting Documentation
- Technical Memorandums
- Value Engineering
- Fit-Gap Analysis

Public Engagement/Communication

- Public Communications
- Press Releases
- Public Consultations
- "Go Live" Announcements

Project Safety and Security

- Safety Management Plan
- Daily Safety Reports
- Site Orientations
- Site Safety Procedures
- Safety or Security Training
- Work Registry
- Safety Statistics
- Access Control
- Emergency Response Plan

Project Transfer Documents (deliverables)

- Training Materials
- Commissioning Documents
- Asset Register Information
- Operation and Maintenance Manuals
- Warranties
- As-built Records

Retention/Destruction

City of Winnipeg By-Law 86/2010 governs retention periods for specific records, which include project records. In order to identify and decide whether or not to keep a record, this procedure contains definitions of the different categories and types of records encountered on a project as well as the criteria for their disposition.

Each category of record has several types. For example, project records can range from regular status reports to financial records. Bylaw 86/2010 requires that all records be kept for 1 year to satisfy public access requests. However, all retention lengths included below exceed this standard. In order to assist program staff in their disposition of records, the following chart outlining retention periods for each type of record has been created to facilitate the process:

Category	Retention Length	Additional Information
Asset related	Life of asset + 2 years	Life of the asset refers to the point in time where a specific asset (ex: a pump) is taken out of service. Documents such as drawings and key reports (quality management, SOPs) fall under this category, and should be retained for two years after the asset is no longer operational
Financial	7 years	Refers to budgets, financial records, financial reports, etc. Also includes time tracking records *Section 2.03 of By-Law 86/2010*
Contracts	6 years after expiry	Contracts, such as those relating to capital projects and contractors, should be kept for 6 years after their expiry date. Expiry date is considered to be date where the contracted party has met their final obligation as detailed in the contract. An example of this could be the end of the warranty period *Section 5.08 of By-Law 86/2010*
Correspondence	See additional information	Correspondence is governed by the subject matter it contains. For example, correspondence containing financial information should be retained for the financial length of 7 years. However, if the correspondence pertained to a progress report that contained no financial information, it falls under the general category only needs to be retained for 3 years
Policies & Procedures	2 years after being superseded	Superseded refers to the point in time when a new policy or procedure that replaces one in question is official approved for use *Section 5.13 of By-Law 86/2010*
General	3 years	All records that do not fall under other categories. This will most likely be progress and phase based reporting and general correspondence not related to other categories *Section 5.12 of By-Law 86/2010*
Human Resources	60 years from last day worked	Records should be maintained for 60 years starting from the last day worked. However, the City's Human Resource area will be responsible for the maintenance and disposition of these records.

Archival

Records that require archiving will follow the City of Winnipeg's procedure for archiving and be managed by the specific Departmental owner of the record. This process is beyond the scope the Project Management.

References and/or Resources

Title	Description	Document Location
City of Winnipeg By-Law 86/2010	City of Winnipeg By-Law that governs retention periods for specific records.	