



COMMISSION FINANCE COMMITTEE
MEETING MINUTES
May 24, 2016

PRESENT: Commissioners Elofson, Rodriguez and Lynch.

No. Topic

1. **INTERNAL AUDIT REPORT**

Commissioners Elofson, Rodriguez and Lynch, along with HRSD and SC&H staff, reviewed the [Internal Audit Report](#) on Design & Construction CIP Project Management.

Joe Freiburger with SC&H summarized the methodology and reviewed the audit process. The team prepared the attached business process [flow charts](#) as part of the audit.

Mr. Freiburger expressed appreciation for the cooperation the SC&H team experienced from everyone in the Engineering Department involved with the audit.

Chairman Elofson thanked Mr. Freiburger for the report and stated that this type of audit, more of a process improvement review, was what he hoped would come out of this process. He thanked Bruce Husselbee for all the work the Engineering Department did in cooperation with the auditors and also for being the first to be audited using this process.


Attachments: [Internal Audit Report](#) and [Business Process Flow Charts](#)

Public Comment: None

Next Committee Meeting Date: September 2016

Meeting Adjourned: 11:12 a.m.

SUBMITTED:


Jennifer L. Cascio
Secretary

APPROVED:


Frederick N. Elofson
Committee Chair



Expertise that Works

Design and Construction: CIP Project Management Review

Hampton Roads Sanitation District

May 11, 2016

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I. Executive Summary

Background

SC&H conducted an audit of the processes related to Hampton Roads Sanitation District (HRSD)'s Engineering Department's Design and Construction (D&C) Capital Improvement Program (CIP, or Program).

Capital Improvement Program

Each year, HRSD prepares a CIP for the capital projects currently underway or proposed to be undertaken in the future for the upcoming 10 years. A capital project consists of acquiring or adding assets such as property, plant, and equipment. Typically, these projects cost \$100,000 or more, have an anticipated life span of 20 years or more, and/or take several years to complete. The plan describes the project name, description, justification, estimated cost, funding, and schedule for each CIP project. The CIP is reviewed by the Commission, which must appropriate the estimated total project cost before the capital projects can begin. The FY2016-2025 CIP proposed spending is approximately \$1.39 billion. Of the proposed spending, 69% pertains to regulatory capital improvements.

The Engineering Department is responsible for the planning, design, and construction for most CIP projects. The Engineering Department oversees approximately 85% of current CIP projects. The planning functions are managed by the Planning and Analysis Division of the Engineering Department. CIP implementation is the responsibility of the D&C Division. Typically, the CIP projects are designed and administered by third-party consulting firms and constructed by third-party contractors, with project management and coordination performed by D&C. D&C's goal for CIP projects is to provide the highest level of functionality, quality, safety, cost effectiveness, and a timely delivery. The Mission Statement for the D&C Division is: We manage design, construction and related services to provide high quality, economical and timely needed infrastructure.

D&C Division

The D&C Division is divided into two groups: North and South Shores. Each group is responsible for managing the CIP projects of the treatment plants, pipelines and pump stations within their geographic area. The Middle Peninsula activity falls under the purview of the North Shore D&C Division. As of March 3, 2016, the North Shore and South Shore D&C Divisions were managing 59 and 32 CIP Projects, respectively.

There are two Chiefs of Design & Construction overseeing the D&C Division, one for the North Shore and one for the South Shore. The Chiefs provide advice and assistance to the Project Managers (PMs). Additionally, the Chiefs approve consultant and contractor invoices and project changes over established dollar thresholds.

The D&C Division has a total of nine authorized internal PM positions; five in the North Shore and four in the South Shore. The PMs are responsible for managing CIP project day-to-day activities such as coordination, technical review, and contract administration throughout the planning, design, and construction phases. PM duties include scope development, professional services selection, design, construction administration, inspection, and warranty. Duties also include coordinating changes with consultants, contractors, HRSD customers, regulators, and localities, as necessary.

Both divisions have a contract specialist responsible for performing a variety of professional, technical, and administrative work to support the Engineering Department. For example, the contract specialists assist in processing invoices, payment requests, and advertising requests for proposals.

The Engineering Department also has a Community Relations Liaison, who supports the department by performing public relations functions such as communication with external stakeholders (e.g. citizens, businesses, local governments, civic organizations, etc.) for CIP projects. The Community Relations Liaison becomes involved with a project prior to the start of construction. The Community Relations Liaison will attend open house forums, if applicable, and/or meet with concerned external stakeholders throughout the construction phase. Once a month, the Community Relations Liaison will accumulate project updates from the PMs, vet the information for comprehensiveness, and forward the updates to be posted on HRSD's website.

CIP Project Management Systems

The two main systems of record utilized for project management activities include Oracle-Primavera-Unifier (Unifier) and the Oracle enterprise resource planning (ERP) system. Unifier, HRSD's capital project management system, is the system of record for all non-financial documents (e.g. consultant and contractor submittals, inspector reports, progress meeting notes, etc.). Unifier was implemented approximately 5 years ago. The ERP system is HRSD's fully integrated, comprehensive suite of business applications. For project management, ERP is utilized to process consultant contract amendments, contractor change orders, invoices and other financial needs for projects. ERP went live for processing CIP invoices, change orders, and contract amendments in April 2015. Both Unifier and ERP have built-in approval workflows to automatically route documentation to the assigned reviewer and approvers.

Objectives

The following audit objectives were established by SC&H based upon the understanding gained during the audit's planning procedures.

- A. Assess the effectiveness of the management and oversight of CIP project schedules and costs.
- B. Evaluate the project management procedures to ensure the expected level of quality is achieved for CIP projects from inception to completion.
- C. Assess the effectiveness and efficiency of the current Design and Construction Division organizational structure and internal communication procedures.

- D. Ensure the existence and effectiveness of communication between the CIP project management and external stakeholders.
- E. Ensure that the management of the CIP projects is in accordance with HRSD processes and procedures, as well as applicable laws and regulations.

Scope

SC&H gained an understanding of the current project management practices to determine when key processes and systems were implemented. As the purpose of this review is to provide recommendations related to current project management procedures, SC&H designed the scope of the audit to focus on the most relevant information. The testing period included activity within the calendar year of 2015, with certain review areas only examining information after April 2015. This is due to the ERP system having gone live for use during April 2015.

For purposes of this review, CIP project management included the processes performed by members of the Engineering Department after a contract has been awarded to a consulting firm or construction company. The procurement processes were deemed to be out of scope.

Methodology and Approach

In order to achieve the objectives of this review, SC&H performed the following procedures.

Process Walkthrough and Flowchart Creation

SC&H began the audit by conducting several meetings with members of the HRSD Engineering Department to identify and walk through the core sub-processes of CIP project management. These discussions focused on process flow, required approval, inputs/outputs, and other control points. Additionally, relevant policy and procedure documentation was obtained and reviewed. Based on these discussions and review of the procedural documentation, SC&H created summarized process flowcharts. The processes identified and documented include:

- Preliminary Engineering Report (PER) Phase
- Contract Amendments Process
- Design Phase
- Construction Phase
- Change Order Process
- Work Change Directives (WCD) Process
- Invoice Review and Acceptance
- Substantial Completion
- Final Payment
- Warranty Period and Project Close-Out

Creation of Project Plan

Based on the understanding obtained of the processes, risks, and related controls, SC&H developed an audit program to achieve the objectives described above. For several audit steps, SC&H selected a sample of projects to review to ensure an adequate representation of the population of projects.

The projects were selected taking into account several criteria including activities from both the North and South Shore, large and small project budgets, projects incorporating regulatory requirements, multiple jurisdictions, different PMs, and various project phases (i.e. in design, construction, and completion).

Execution of Project Plan

SC&H executed the audit plan by completing the following tasks:

- Inquired with Engineering staff to gain a comprehensive understanding of key processes;
- Inspected pertinent documentation and reports; and,
- Tested samples of project management processes.

Additionally, SC&H was granted access to Unifier, ERP, SharePoint, and the Engineering shared drives. This allowed SC&H to independently locate the documentation used for testing and experience the system functionality from a user's standpoint.

Summary of Work

After reviewing processes in place and evaluating the current control environment, SC&H concludes that, while there are no significant internal control shortcomings, there are several process improvement opportunities that exist to increase overall process effectiveness and efficiency. The majority of identified issues can be remediated with formalized, consistent procedures.

Although this report focuses primarily on areas of improvement, SC&H notes that HRSD effectively communicates CIP project information to external stakeholders (e.g. jurisdictions, citizens). Additionally, SC&H identified a positive relationship and effective communication between HRSD and the third-party contractors and consultants.

The following section provides detailed observations and recommendations regarding eight separate topics.

We appreciate the assistance and cooperation of the management and staff of HRSD's Engineering Department during the performance of the D&C CIP Project Management review. Please contact us if you have any questions or comments regarding any of the information contained in the audit report.

SC&H Group



Joseph D. Freiburger, CIA, CISA, CPA
Director

II. Detailed Observations and Recommendations

Observation 1

Project monitoring procedures and tools are not consistently documented and administered.

Observation Detail

The project cost and schedule monitoring practices are not consistent among the Project Managers. These practices vary between utilizing some, or all, of the following project monitoring tools: consultant progress reports, inspector reports, construction progress meetings, contractor Schedule of Values, contractor baseline schedule, contractor updated schedule, Unifier Cost Manager, Unifier Schedule Manager, ERP project dashboard, informal communication (i.e. emails and phone calls), Outlook notifications, and site visits. The frequency of use and timeliness of information of these documents varies between projects and PMs.

These tools do not provide consistent information with respect to each other to allow the PM to measure project progress against baselines, milestones, actual vs. budget, etc. For example:

- The project milestones tracked on the Consultant Progress Reports (e.g. Final Construction Cost Estimate, Pre-Construction Meeting, etc.) do not align with the Schedule Manager milestones in Unifier which are broken down by phase (e.g. Pre-Planning, PER, Design).
- The Contractor Schedule of Values, which lists activity descriptions (e.g. Contractor Bonds and Insurance, Preliminary Treatment Facility) by total value, does not align with the Cost Manager in Unifier which is broken down by various amounts (e.g. CIP Budget, Appropriated Budget) by phase (e.g. PER, Design) or costs in ERP.
- The ERP records are set up by purchase order number, not project, and multiple projects can be tied to a purchase order.

Additionally, the current tool utilized for the contract specialist to monitor project costs during invoice processing is an internal spreadsheet that is manually updated based on the contractor's Schedule of Values. Discrepancies were noted between the contract specialist's internal spreadsheet and the contractor's Schedule of Values.

The policy and procedure documents state that the PM should perform contract administration and track milestones and performance metrics. However, the policy and procedures do not provide adequate guidance on how the PMs should perform these duties.

Risk

A lack of standardized project monitoring activities may result in inadequately monitored project costs and schedules resulting in reduced timeliness of the identification of project budget variances and work performance timeline delays.

The tool used by the contract specialist in the manual invoice process results in inefficiencies and the potential for errors.

Inconsistently documented and administered project monitoring practices may result in challenges with process knowledge transfer during transitions to another PM due to promotions, terminations, and new hires.

Recommendation 1.1

Management should identify and document a standard process including the tools the PMs should utilize to adequately and effectively monitor project schedule against the established baseline and/or milestones and actual project costs vs. budgeted costs. The identified tools should allow the PM to compare consistent information between contract and status documentation to allow for adequate measurement. The project monitoring process should be housed in one of the existing systems (i.e. Unifier or ERP) to enforce consistency amongst the PMs and allow for transparency to Executive Management. The formalized guidance should define the overall process, procedures, and tools for project monitoring. However, the procedures should allow for flexibility in the project monitoring activities to allow PMs to apply the most appropriate management tools to each unique project.

Management should evaluate Unifier’s functionality to reorganize the Cost and Schedule Managers to track specific project milestones that are more detailed than the current phase-based structure (i.e. PER, Design, Pre-Construction, Construction, etc.). Specific considerations and updates may include the following.

- At defined intervals during project performance, the PMs should enter the actual completion dates into Unifier for the same milestones that are reported on the consultants and contractors progress reports and schedules.
- PMs should enter the amounts expended to date for each milestone in Unifier from the consultant and contractor invoices.
- The system may be configured to automatically calculate the project/milestone budgets remaining and flag any costs that are about to exceed, or have exceeded the maximum amounts identified. The contract specialist’s manual invoice tracking process would be replaced with electronic monitoring in the system, increasing process efficiency.
- The baseline and actual schedules and costs may be queried into reports for Management to easily understand the current progress of each project.

Management’s Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. The Engineering Department, with assistance from other internal stakeholders, will form a team to suggest improvements. This team will begin their work within 60 days once HRSD Senior Management has concurred with this approach. The team will develop detailed action plans along with definitive timelines.

Observation 2

The current staffing levels and resulting workload impact the PMs' ability to effectively perform project management activities and monitor all consultants and contractors.

Observation Detail

We noted that the South Shore was fully staffed based on the Engineering Organizational Chart with three PMs and in the process of filling the fourth project manager position. Conversely, the North Shore was staffed with only two of the five PM allocated positions (with the Chief of Design and Construction assisting with project management responsibilities), to administer approximately 60 projects. It is our understanding that the D&C North Shore Division was in the process of recruiting and hiring additional PMs.

Risk

The dual role performed by the North Shore Chief can result in separation of duties issues, as under normal staffing conditions he has guidance and approval authority over the PMs. Additionally, being understaffed may have an adverse impact on the oversight of the North Shore CIP Projects as PMs may have a reduced ability to dedicate necessary attention to individual projects. As a result, PMs may place greater reliance on consultants and contractors to monitor project progress, schedule, costs, risks, etc. PMs also have the reduced availability to independently verify the information provided to them contractors and consultants.

Recommendation 2.1

Management should consider hiring additional employees to assist with administrative tasks to lessen the PMs' workload, allow them the ability to allocate more time to core project management activities and consultant/contractor oversight. Alternatively, Management may consider increasing the role of current administrative employees to further support the PMs.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. Recruitment is underway to back-fill two open Project Manager Positions on the North Shore. The newly hired Engineering Clerk has begun to assist North Shore Project Managers with administrative support. The proposed team listed in Observation 1 will also review staffing needs. This team will begin their work within 60 days once HRSD Senior Management has concurred with this approach.

Recommendation 2.2

Management should consider establishing "hybrid" PMs who split time between the North and South Shores. These mixed responsibility positions may be temporary during the current PM shortage, or can be a more permanent solution to allow flexibility in maintaining a fully staff management team.

Management's Action Plan and Implementation Date

Staff agrees with this observation and recommendation. We have already begun sharing Project Manager duties between North Shore and South Shore projects.

Observation 3

There is not a consistently performed QA/QC function to define quality and measure the final product to ensure the expected level of quality is obtained.

Observation Detail

The current project management processes in place related to quality include the PM reviewing daily/weekly consultant inspection reports and the joint and final inspections with the PM, consultant, and contractor. Additional QA/QC efforts may be conducted, on a project by project basis. SC&H noted that HRSD has a partnering agreement for the Virginia Initiative Plant Nutrient Reduction Improvements Contract B project with the consultant, contractor, Virginia Department of Environmental Quality, and other organizations that are involved with the project. The mission of the agreement includes a quality product and one of the partnering goals is to produce a quality product with zero quality issues.

An expected level of quality, or methods to measure the quality of completed projects, is not defined. Contractors and consultants are not required to provide specific QA plans that define expected quality levels and steps to ensure successful completion as part of project deliverables.

Risk

The lack of a standardized, consistently applied QA/QC process may result in completed projects where stakeholder's expected level of quality is not achieved, resulting in additional work. This can cause cost and scheduling overruns.

Recommendation 3.1

Management should establish a uniform QA/QC process to define quality and measure the final product to ensure the expected level of quality is obtained for each project. Based on common practices of similar organizations, the process should consist of the development of a quality plan to document the acceptable level of quality, as defined by the customer. The plan should describe how the project will achieve the defined level of quality in its deliverables and work processes. This plan will help the PM determine if the deliverables are produced to the acceptable level of quality. This process should also consider the cost vs. benefit of employing such a plan on each project. HRSD should identify a cost threshold for instituting the full QA/QC plan. A modified or less detailed plan may be implemented for smaller projects.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. The proposed team listed in Observation 1 will also review QA/QC protocols. This team will begin their work within 60 days once HRSD Senior Management has concurred with this approach.

Recommendation 3.2

Management should consider creating a QA/QC Administrator position. The purpose of the QA/QC Administrator would be to ensure quality is defined, monitored, and adequately achieved for each project. The QA/QC Administrator would be responsible for ensuring a quality plan is developed and implemented for each project. Also, the QA/QC Administrator would perform quality audits at key milestones to monitor each project's compliance to the quality plan. Once the audit is completed, the QA/QC Administrator would create a report of the findings and areas of concern. Management could determine a threshold (e.g. project cost) for which the benefit outweighs the cost of a quality audit.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. It should be noted that Engineering Department Staff work closely with Operations Department Staff in numerous ways to define project expectations including quality of projects. The proposed team listed in Observation 1 will also review QA/QC staffing needs. This team will begin their work within 60 days once HRSD Senior Management has concurred with this approach.

Observation 4

Project related risks that may impact successful completion (e.g. cost overruns and delays due to unforeseen complications) are not consistently considered, documented, and monitored in a formal manner.

Observation Detail

The *Standards and Preferences* document, a guidance document provided to the consultants by HRSD, references the Capital Project Cost, Schedule, and Risk Reporting at Milestones report that is updated and submitted by the consultant at specified phases of the project. This report details the projected completion, project costs, duration to reach both substantial completion and final completion, and risks to these updated costs and durations for each project that the consultant has underway. However, the *Standards and Preferences* document does not explain how to identify, analyze, and respond to risks. Further, SC&H noted this report is not consistently completed and reviewed by PMs.

Risk

A lack of a formalized risk management approach may result in inconsistent processes for identifying, documenting, and managing risk throughout the project life cycle.

Recommendation 4.1

Management should implement a formalized risk management process to ensure risks are consistently considered and effectively managed throughout each project. Based on identified practices of similar organizations, Management should consider establishing a two-phased risk management approach: qualitative and quantitative. The qualitative phase consists of a brainstorming session with industry experts, project team, and/or stakeholders where risks are identified, listed, and agreed upon. During the quantitative phase, the probability and impact of the risks are calculated for each identified risk and documented on a risk register. The purpose of the risk register is to log and accumulate all potential issues that may impact project. Additionally, mitigating actions and comments are included for each risk on the risk register. Once the risk register is complete, it is provided to the consultant to maintain on a regular basis. The consultant updates the risk register in conjunction with the formal submittals and submits to the PM. D&C Management should determine a project cost-benefit threshold for applying this methodology.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. The proposed team listed in Observation 1 will also review Project Risk Management. This team will begin their work within 60 days once HRSD Senior Management has concurred with this approach.

Observation 5

The current IT system configuration/ structure results in project management process inefficiencies and inconsistencies.

Observation Detail

SC&H identified the following instances of inefficiencies and inconsistencies within the project management process due to the current IT system structure:

- Internal personnel, consultants, and contractors noted that Unifier and ERP are not user friendly systems and that they have experienced difficulties accessing and documenting information. SC&H experienced similar difficulties when locating documentation for this review. The following items were identified:
 - Project documentation can be stored within two main locations in Unifier: Capital Project and Archived Capital Projects. Within Unifier Capital Projects and Archived Capital Projects, the folder structure and locations to save documentation vary project by project.
 - Project documentation for larger projects is stored on the contractor’s external system until the end of the project, at which time all project files should be uploaded to Unifier.
 - In ERP, change orders, contract amendments, and invoices are tracked by purchase order number not by project.
 - In addition to Unifier, ERP, and contractor systems, project documentation may be stored in SharePoint, network drives, local drives, and email.
- The systems in place are not configured to generate reports indicating the population of change orders, contract amendments, and work change directives (WCDs) for all projects.
- According to the *Guideline and Procedures Manual*, PMs are authorized to approve WCDs up to \$25,000. However, when a WCD was processed in Unifier, it was noted the WCD was routed to the PM for review and then to the Chief for approval, resulting in an unnecessary review, as the system workflow does not mirror the policy document.

Although the observation has been noted and there are items that Management should address, SC&H notes that Management has made proactive efforts to streamline the process and reduce inefficiencies. The Engineering Department is current implementing a series of checkpoints in Unifier where the project status cannot proceed until certain documents are uploaded into the system. This will assist in ensuring certain project documents are maintained in a central location.

Risk

Systems that are difficult to use may result in inefficiencies in the process, causing administrative and filing challenges for PMs. Additionally, challenges in storing and locating documentation due to a lack of standard documentation maintenance and a central location for storage can result in the inability to retrieve necessary documentation in a timely fashion, potentially impacting effective decision making.

Project costs tracked by purchase order may result in inconsistent and inefficient monitoring activities as PMs receive project costs from the consultant and contractors by project; however, purchase orders can track the costs of several projects or a project can be broken down by multiple purchase orders.

The inability of the systems to generate reports of the populations of the documentation noted reduces the ability of HRSD to analyze relevant data. Additionally, it reduces the auditability of the process, which can result in challenges in future external review scenarios.

Systematic workflows that do not mirror policy and procedures result in additional review, reducing process efficiency.

Recommendation 5.1

Management should update the existing policies to describe uniform procedures for project documentation maintenance and storage in a central location. This will allow documentation to be maintained consistently and located in a timely and efficient manner.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. The Engineering Department Guidelines and Procedure Manual are under revision and should be updated by July 2016.

Recommendation 5.2

Management should evaluate the current system functionality to determine whether reports can be generated for change orders, contract amendments, work change directives, and invoices to adequately monitor project progress, contractors, and consultants.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. The proposed team listed in Observation 1 will also review Project Management reporting. This team will begin their work within 60 days once HRSD Senior Management has concurred with this approach.

Recommendation 5.3

Management should review the system approval workflows and processes and ensure they are in agreement with policies and procedures. This will help to reduce unnecessary tasks and provide uniform guidance.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. The proposed team listed in Observation 1 will also review Project Management workflows and processes. This team will begin their work within 60 days once HRSD Senior Management has concurred with this approach.

Recommendation 5.4

Management should consider offering additional training on ERP and Unifier to ensure users are fully utilizing the system capabilities and are performing systematic tasks in a consistent manner. This training should be based on the key processes performed by the project management team and offer keystroke walkthroughs for navigating these systems.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. Further training will be offered to Project Managers within the next 60 days.

Observation 6

The hierarchy and process for project change decision making is unclear.

Observation Detail

The hierarchy for project change decision making is not clearly defined. The *Guideline and Procedures Manual* states, "the Project Manager (from the Design & Construction Division or other Department managing the project) should approve all changes to the project. The scope of the project should be kept within that outlined in the description of the project and/or presented to the Commission through briefings. The scope should not be substantially changed or expanded without approval of the Director of the Department managing the project and the briefing and approval of the General Manager and/or Commission as appropriate." The manual provides approval thresholds for Project Managers, Chiefs, Director of Engineering, GM, and Commission for change orders, work change directives, and contract amendments. However, inconsistencies were noted in the approval process.

Based on the current approval thresholds, a PM can authorize a change in construction work prior to the formal change order approval process via a WCD. As change orders and WCDs have different approval thresholds for PMs, a contractor could perform work approved with a WCD that may later be rejected in the change order approval process.

Risk

Unclear decision making authority may result in changes being authorized by one individual but rejected by another individual resulting in contractors performing work that can be rejected at a later time.

Recommendation 6.1

Management should clearly define and communicate to appropriate individuals the decision making authority for change orders, contract amendments, and work change directives to ensure all appropriate approvals are obtained prior to work being performed. For example, Management could develop an approval matrix that is easy to understand and access. The approval matrix can contain each type of change, required approvals, related dollar thresholds, and delegated approvals due to absences. When updating authority guidance, Management should also ensure that all approvals which authorize work to continue or proceed are final and do not require additional approval. If a change to a project requires additional approval, work should not begin until the final acceptance has been obtained.

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. The Engineering Department Guidelines and Procedure Manual are under revision and should be updated by July 2016 which should clarify this concern.

Observation 7

Policy and procedural documentation does not reflect the current practices performed by HRSD project management.

Observation Detail

The *Guideline and Procedures Manual* has not been updated since June 2012, during which time processes and systems have changed. Throughout the completion of this review, SC&H identified multiple differences between the policy documents and the current practices of the project management team. In addition, job descriptions and responsibilities for team members have not been updated in two to four years.

Risk

With outdated policies and procedures, employees may be unaware of current process requirements. Inconsistencies between policy and current practice may result in processes not being performed 1) as Management intended, 2) in a consistent way that meets the District's needs, or 3) that captures and communicates important information.

Recommendation 7.1

Management should review and update existing policy and procedure documents to ensure the documents reflect current practice or to determine whether current practice needs to be adjusted to reflect policy. Once updated, Management should develop and implement a process to review and update all policy and procedure documents on a recurring basis (e.g. annually).

Management's Action Plan and Implementation Date

Staff generally agrees with this observation and recommendation. The Engineering Department Guidelines and Procedure Manual are under revision and should be updated by July 2016 which should address this concern.

Observation 8

Opportunities for improvement exist within the current reporting process.

Observation Detail

In the quarterly *Capital Improvement Program Commission Briefing*, cumulative monthly expenditures and reimbursements are reported for the fiscal year to date. Discrepancies in the data reported were found in the July 2015 quarterly CIP Commission Briefing. In the FY2015 cumulative expenditures reported in the July 2015 quarterly update to the Commission, -\$2.9 million on July 2014's supporting documentation was correctly excluded from July's reported amount (i.e. August expenditures for July work only); however, incorrectly included in August 2014-May 2015 reported expenditure amounts (e.g. August's reported amount included July, August, and September's expenditures not just August and September's for work completed in July and August). Additionally, the cumulative expenditures reported in June 2015 were \$9.6 million greater than the supporting documentation.

Although the observation has been noted and there are items that Management should address, SC&H notes that the FY2016 cumulative monthly expenditures were accurately reported on October 2015 quarterly CIP Commission Briefing.

Risk

The presentation of inaccurate and/or incomplete information in the internal stakeholder reports could potentially affect management's ability to make well-informed decisions.

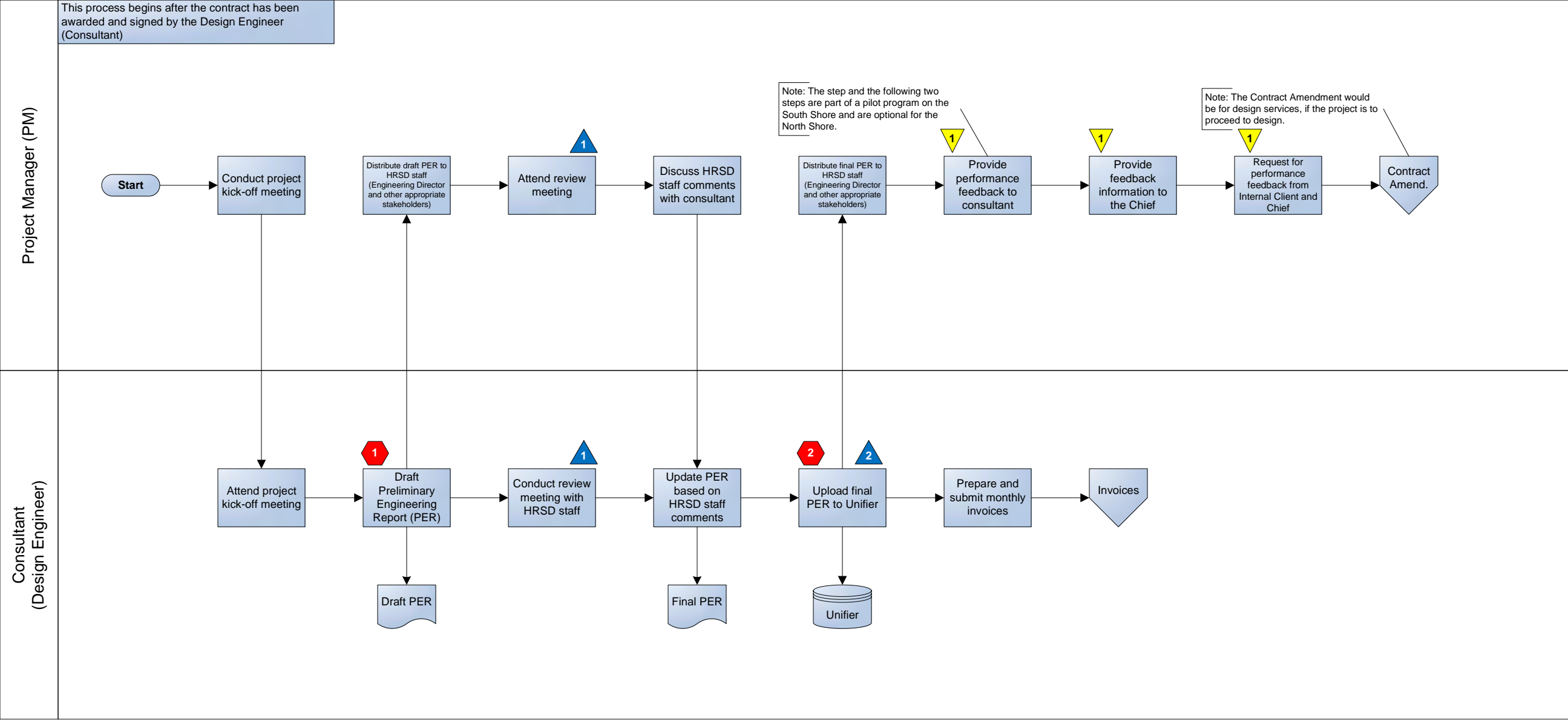
Recommendation 8.1

Management should ensure that a detailed review is performed by an independent reviewer to confirm that information reported to the Commission, impacting potential decision making, is accurate.

Management's Action Plan and Implementation Date

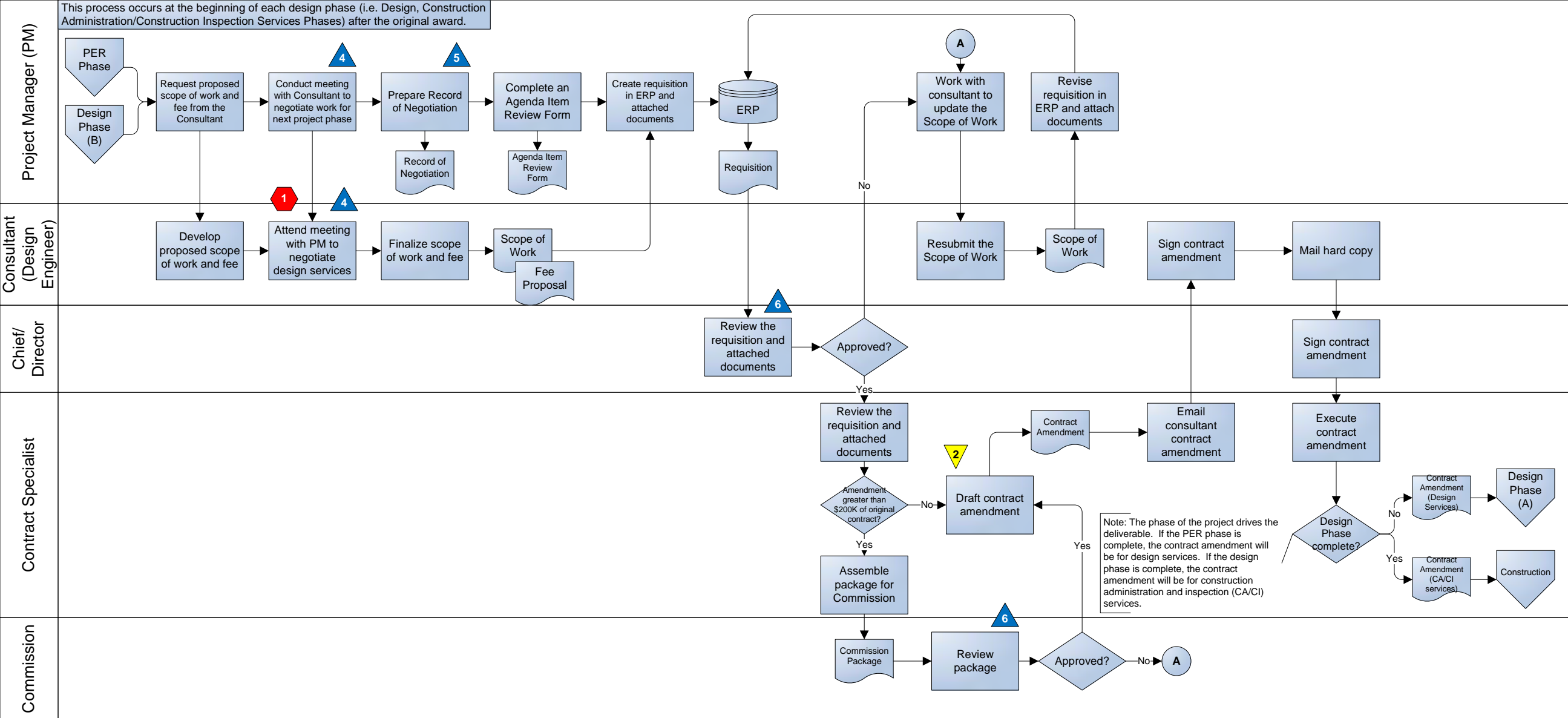
Staff concurs that a data point was inaccurately added to the document in question. This error was corrected shortly after it occurred and since this was an isolated problem, creation of an independent review process is not warranted at this time.

Sub-Process	Design: PER Phase	Business Unit	Engineering: Design & Construction	Location	District-Wide	Year	2016
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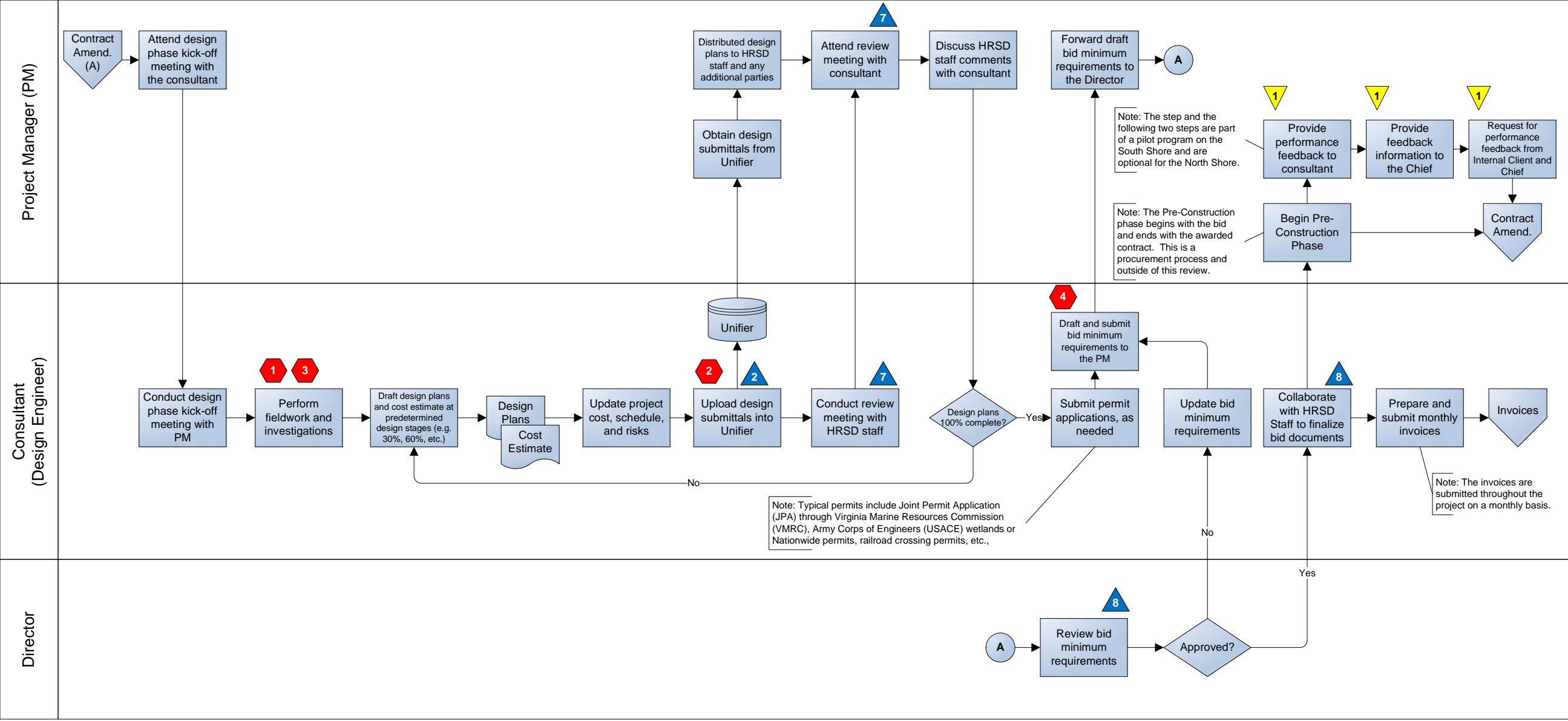
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Sub-Process	Design: Contract Amendments	Business Unit	Engineering	Location	District-Wide	Year	2016
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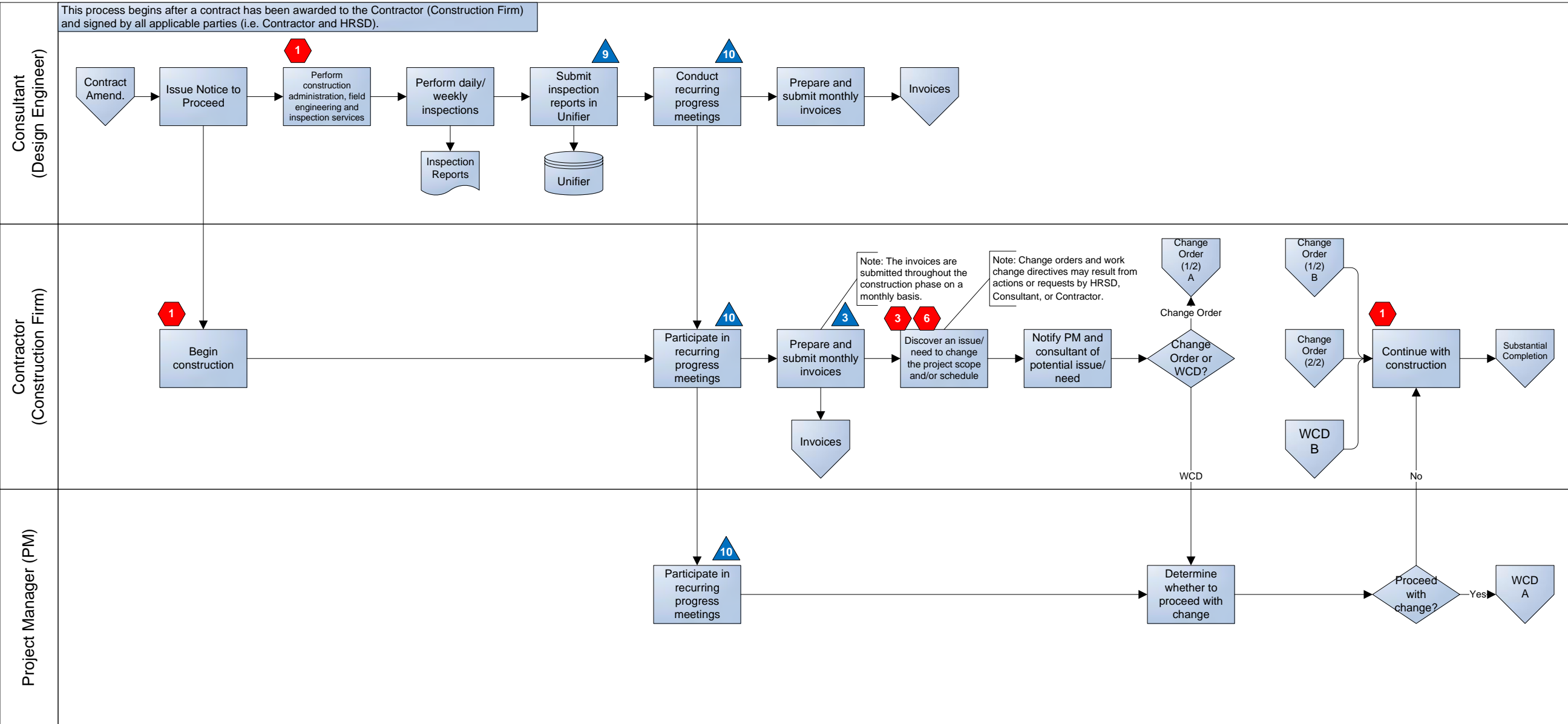
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	Process		Document
	Decision		System
	Off-Page Reference		On-Page Reference
	Flow Begin/End		

Sub-Process	Design: Design Phase	Business Unit	Engineering	Location	District-Wide	Year	2016
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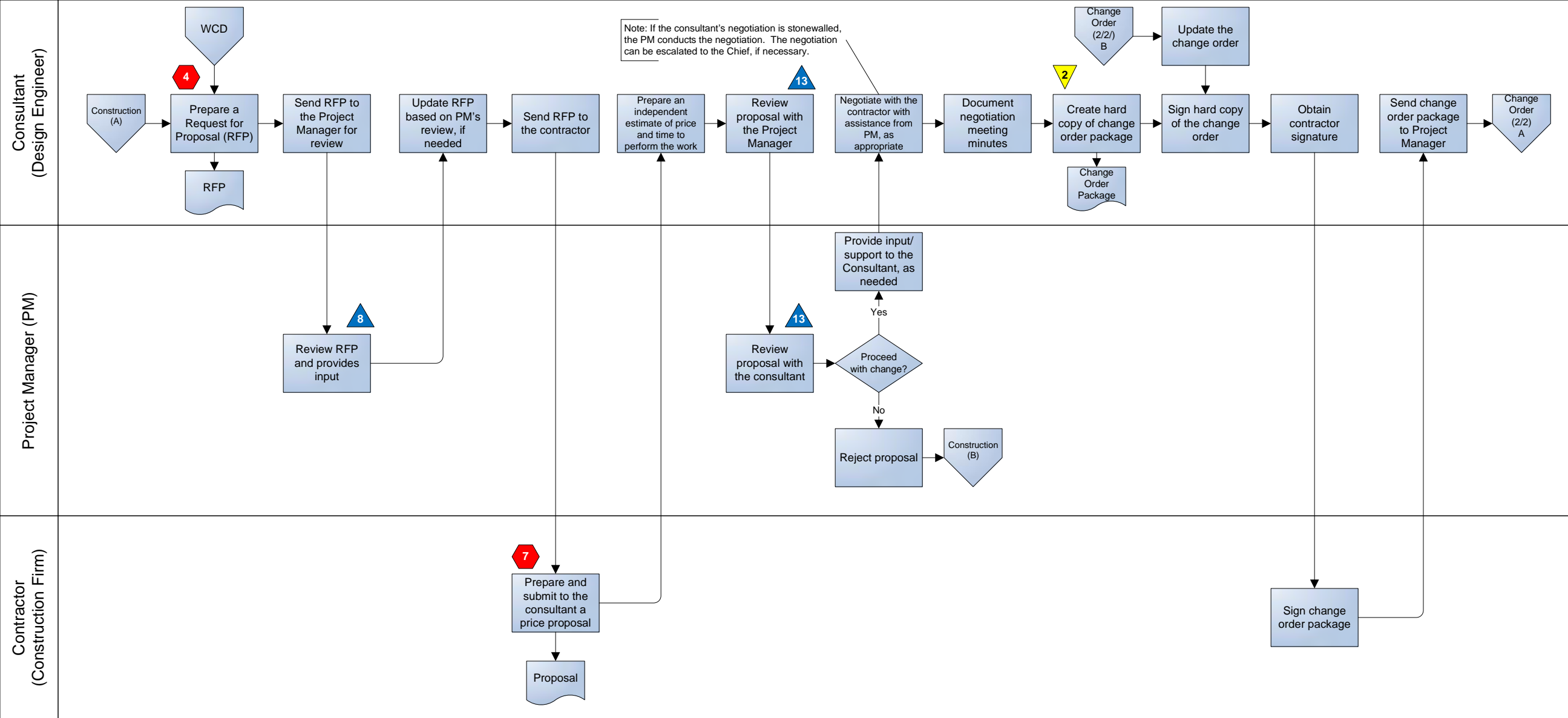
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	Decision		System		On-Page Reference
	Flow Begin/End				

Sub-Process	Construction Phase	Business Unit	Engineering	Location	District-Wide	Year	2016
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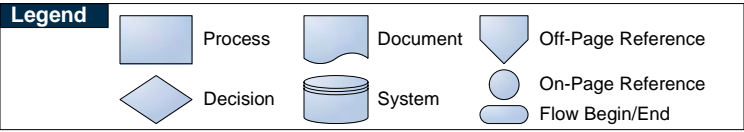
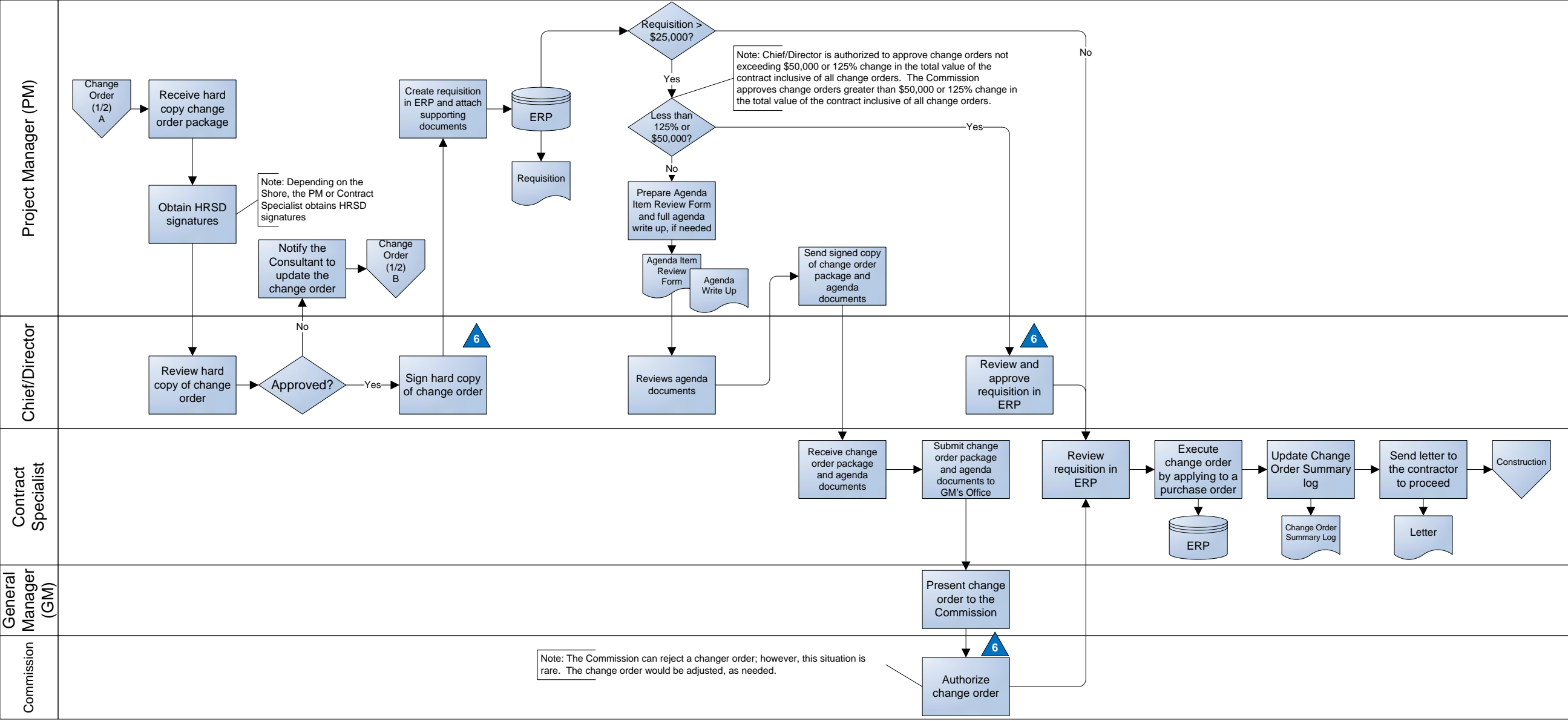


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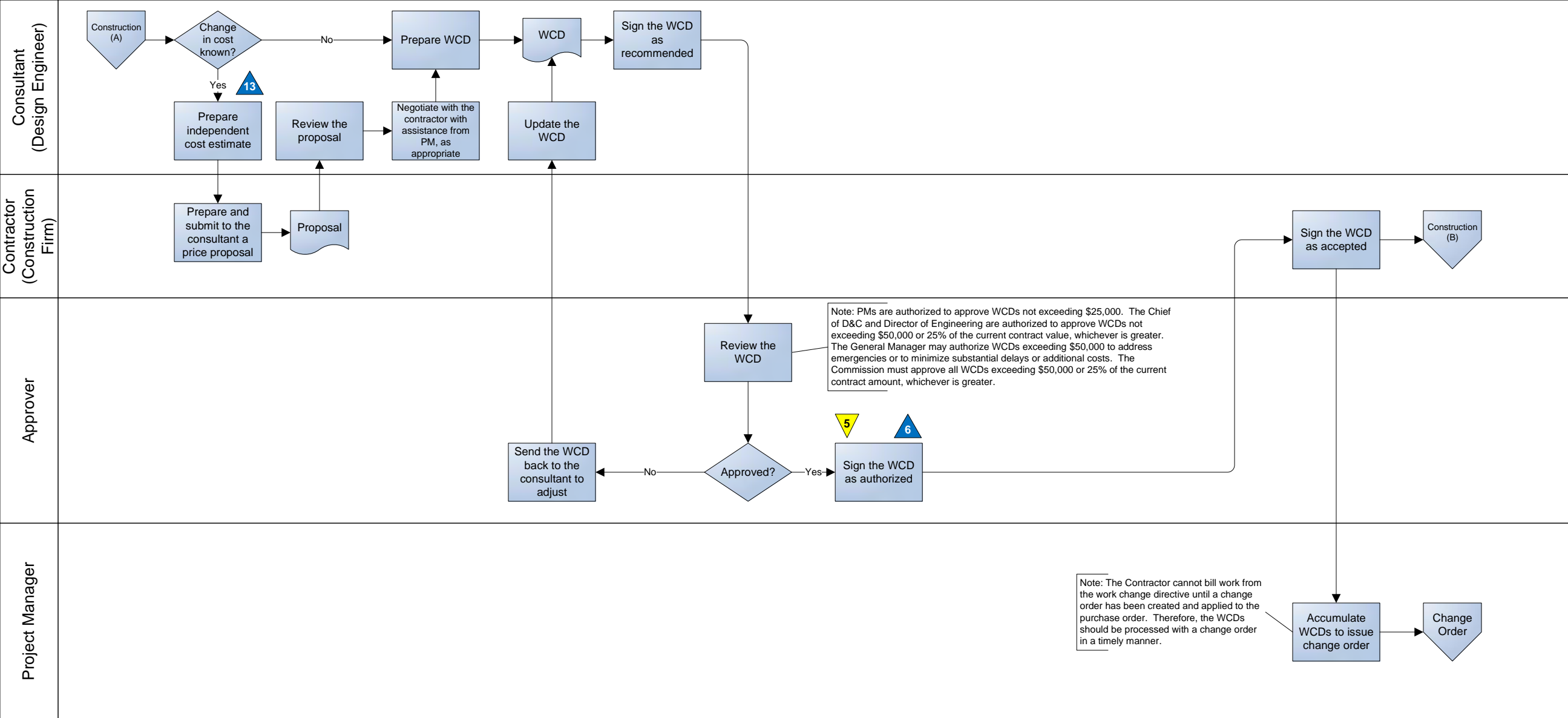
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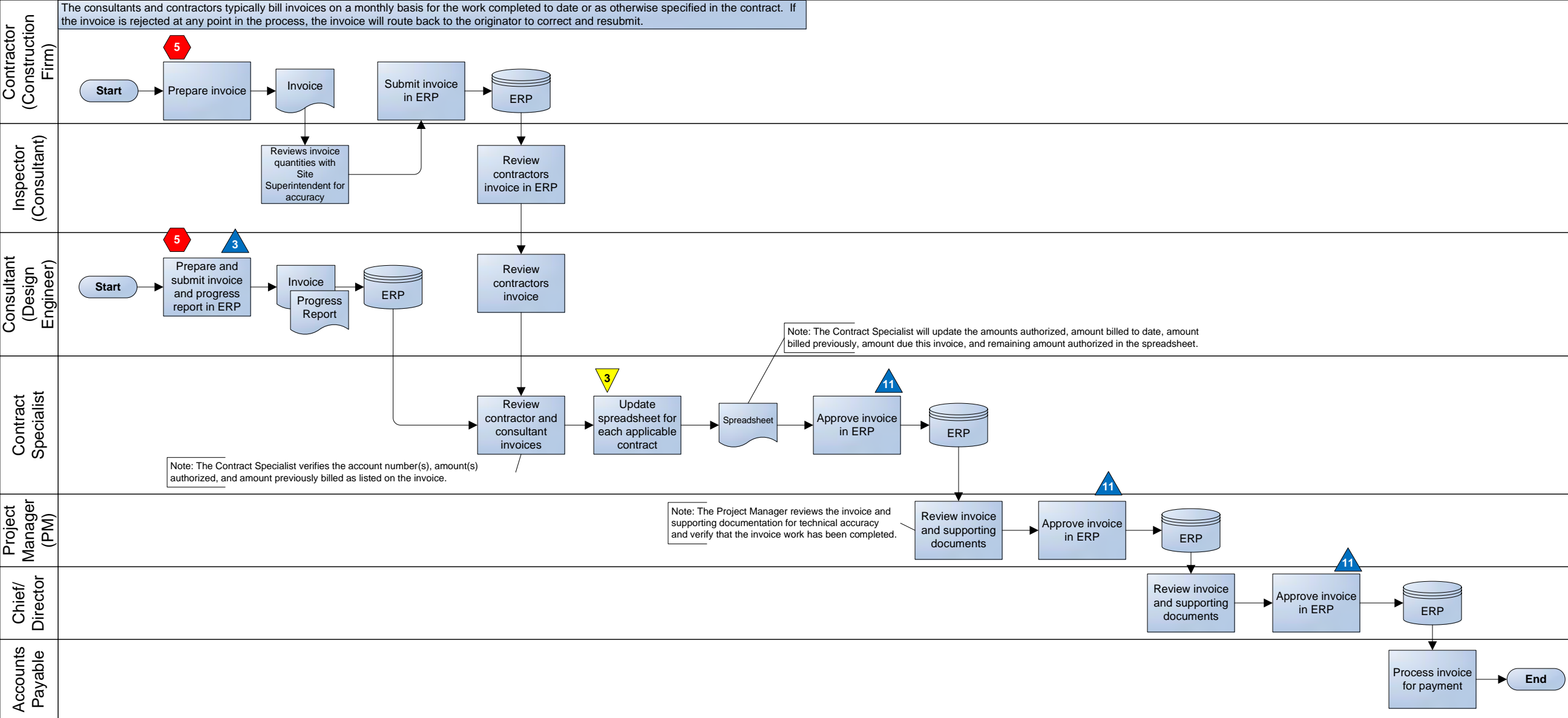


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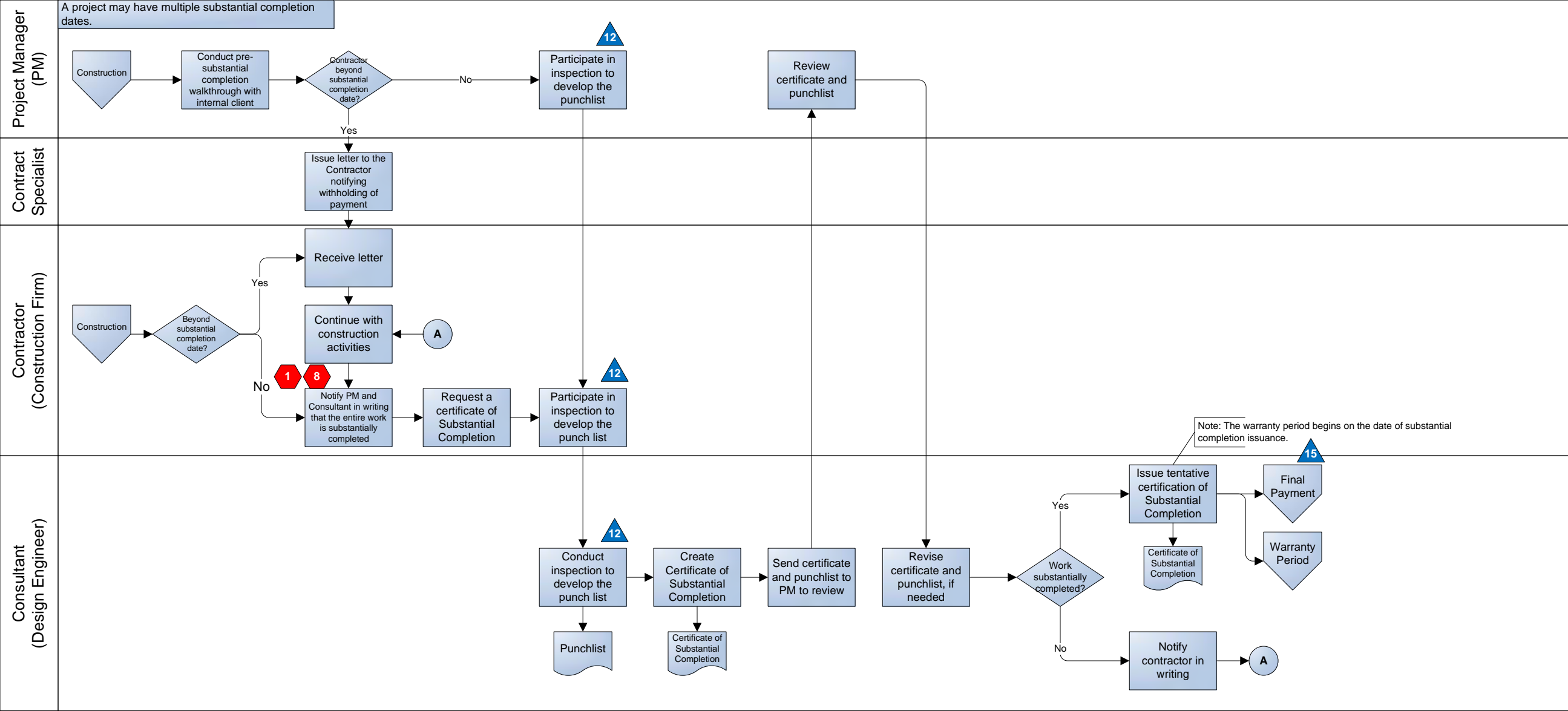
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Sub-Process	Invoices	Business Unit	Engineering	Location	District-Wide	Year	2016
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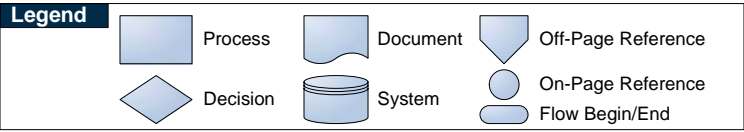
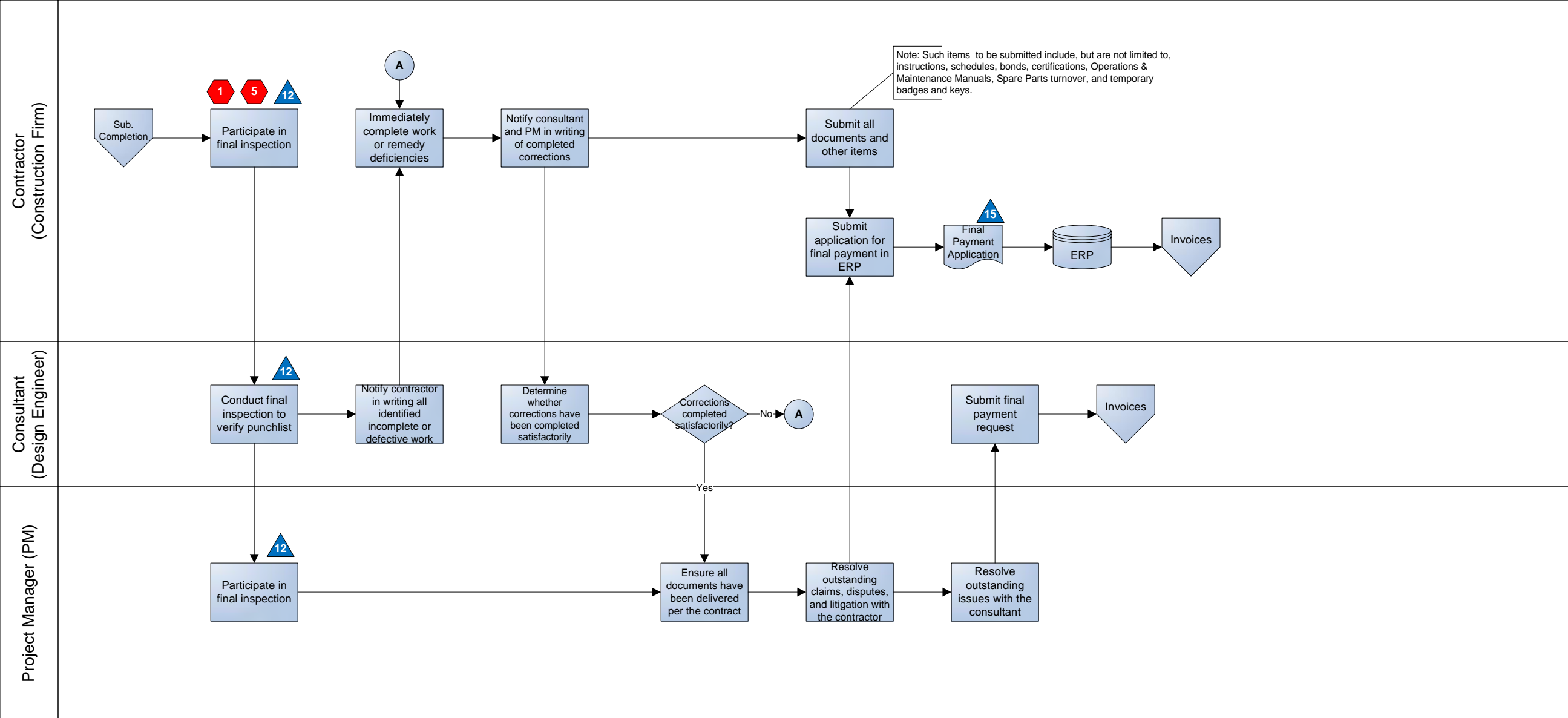


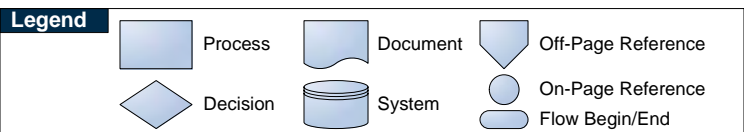
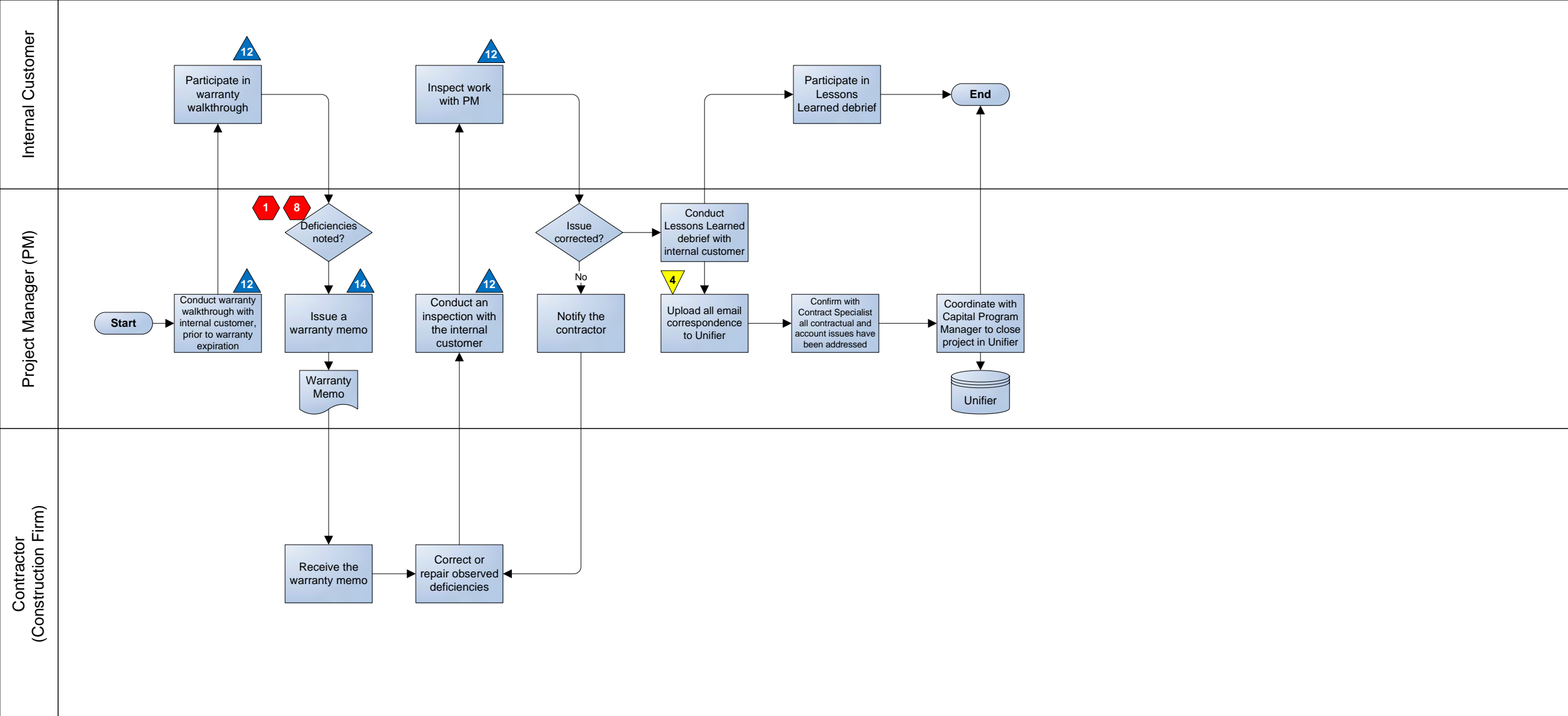
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Sub-Process	Substantial Completion	Business Unit	Engineering	Location	District-Wide	Year	2016
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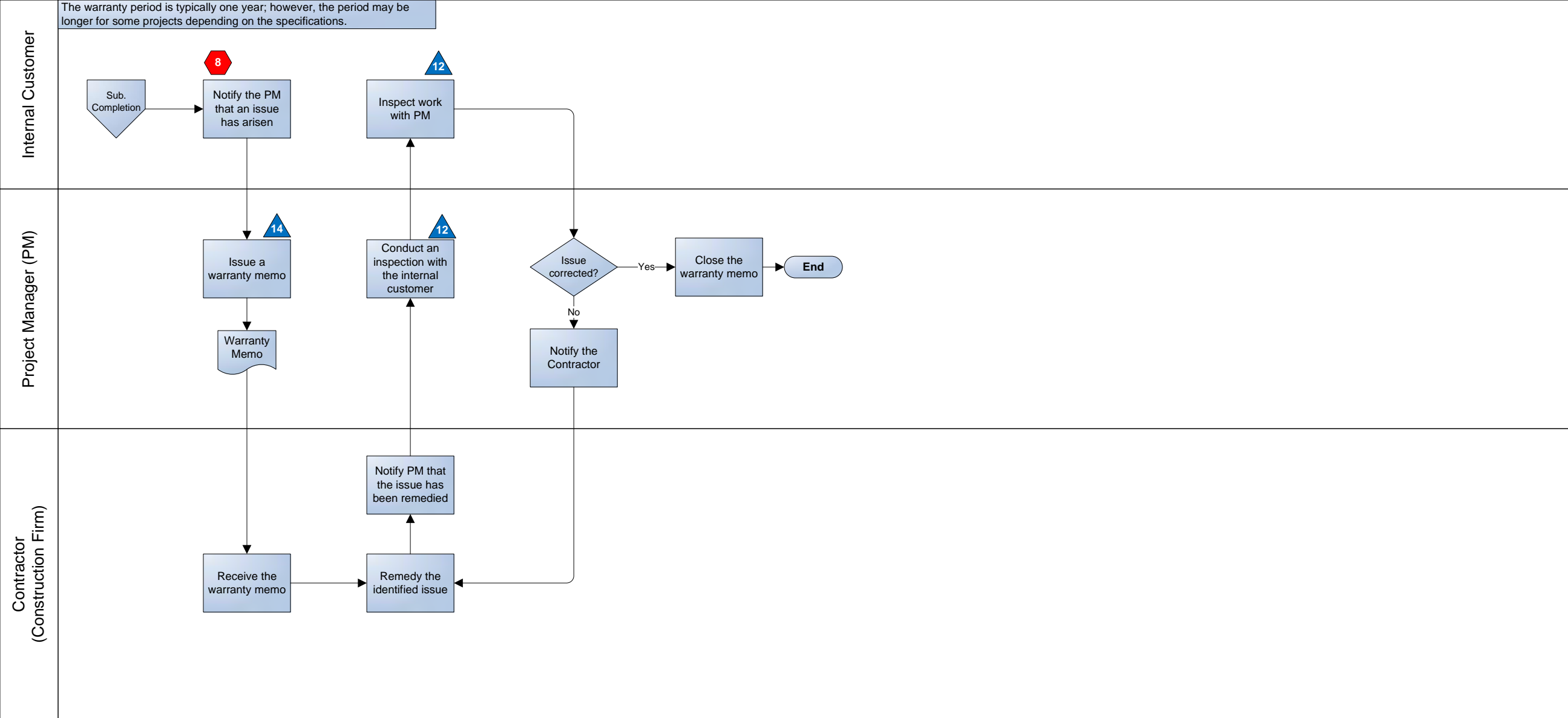


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Sub-Process	Warranty Period	Business Unit	Engineering	Location	District-Wide	Year	2016
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Hampton Roads Sanitation District D&C: CIP Project Management



Process Information

Positions

Accounts Payable: Processes payments to contractors and consultants.

Commission: Formally approves each individual project through their approval and appropriation of funds for the Operating Budget, Improvement Budget, Construction Contracts or other special appropriation for the project. The Commission must approve all change orders, work change directives, and contract amendments exceeding \$50,000 or 25% of the current contract amount, whichever is greater.

Consultant (Design Engineer): Provides professional and non-professional services including architecture, engineering, landscape architecture, surveying, environmental assessment, appraisal and related services.

Contractor (Construction Firm): Provides construction activities to build new facilities and to modify, upgrade, expand, rehabilitate, and/or replace existing facilities.

Contract Specialist: Responsible for processing documents (i.e. change orders, invoices, etc.) for the CIP projects.

Director of Engineering and/or Chief of Design & Construction: Provide advice and assistance to Project Managers, as requested. Approve work change directives and change orders not exceeding \$50,000 or 125% of the current contract amount inclusive of all change orders. Approval contract amendments not exceeding \$50,000. Approve work confirmations (i.e. invoices) and requisitions.

General Manager (GM): May approve change orders and work change directives exceeding \$50,000 as required to address emergency situations or to minimize substantial delays or additional costs.

Inspector: Typically, employed by the Design Engineer. Has day-to-day responsibility for monitoring work on site and reporting observations.

Internal Customer: An HRSD Department that requested the CIP project or has direct involvement in the project.

Project Manager (PM): Responsible for managing the project day to day including coordination, technical review, and contract administration. Approve work change directives not exceeding \$25,000.

Systems

Unifier: HRSD's capital project management system of record for all non-financial documents.

ERP: HRSD's fully, integrated, comprehensive suite of business applications.

Other

Capital Improvement Program (CIP): The CIP is a planning tool that identifies individual projects currently underway or proposed to be undertaken over the next 10 years.

Change Order: Used typically to formally modify Construction Contract to change scope of work, cost, and/or time for performing additional work.

Contract Amendment: Executed with the consultant for each individual task specifying the scope of work, fee, schedule, terms, and conditions.

Preliminary Engineering Report (PER): This report should clearly state the purpose, goals, and assumptions used in preparation of the document. The executive summary of this report should include a brief overview of the project, recommendations, all project costs, and schedule to implement the work.

Work Change Directive (WCD): WCDs are used on occasion to 1) authorize and/or direct the Contractor to perform additional work in a timely fashion when scope of work, cost, or time are difficult to determine beforehand or when scope of work, cost, time, responsibility, or need are in dispute or 2) identify relatively small changes and/or additional work so that several such items can be combined into a single change order.

Punch List: A document prepared near the end of a construction project listing work not conforming to contract specifications that the contractor must complete prior to final payment

Risks	Controls
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	Work is performed or deemed substantially complete that is not in accordance with the contract terms or schedule.	Mitigating Control/s: 1, 3, 4, 5, 7, 9, 10, 12
	Contractors and consultants do not submit contract documents on time.	Mitigating Control/s: 2, 3
	Contractors and consultants initiate work that changes the scope or schedule without proper authorization.	Mitigating Control/s: 6
	Bid documents/RFPs prepared by consultants are not accurate and result in proposals that do not meet HRSD's needs.	Mitigating Control/s: 8
	HRSD is invoiced for the incorrect amount or for work that is not completed.	Mitigating Control/s: 11, 15
	HRSD management is not made aware of project challenges effecting schedule or cost in a timely manner.	Mitigating Control/s: 3, 10
	HRSD overpays for work performed.	Mitigating Control/s: 13
	Contractor does not perform quality work, resulting in subsequent usage issues.	Mitigating Control/s: 14

	A review meeting is conducted with the consultant and HRSD to review the draft preliminary PER. The consultant will update the draft PER based on HRSD's comments presented and discussed at the review meeting.
	Anticipated Control: Gates checklist to be implemented in Unifier, which will systematically require submission of required documentation at key contract milestones.
	Consultants provide monthly progress reports which are reviewed for appropriateness by the PM and D&C management.
	A review meeting is conducted with the consultant and the PM to discuss and negotiate scope of work and fees for next project phase.
	The record of negotiation documents the review meeting conducted for each contract amendment.
	Contract amendments, change orders, and work change directives are appropriately reviewed and authorized by HRSD.
	A meeting is conducted with the consultant and the PM to review the design plans and cost estimates.
	Bid documents/RFPs reviewed and approved by D&C management.
	Daily/weekly inspections are completed by the contractor and submitted in Unifier for PM's review.
	Recurring progress meetings are conducted with the consultant, contractor, and PM to discuss project progress.
	Consultant and contractor invoices are properly reviewed and approved by the contract specialist, PM, and Chief
	Consultant, contractor, internal customer, and PM inspect work completed.



Hampton Roads Sanitation District D&C: CIP Project Management



Risks Controls

13

Project price calculations for contractor price proposals are independently recalculated by the consultant and reviewed with the HRSD PM prior to acceptance.

14

A warranty period of a year or more is built into all HRSD projects. The contractor will be responsible for fixing any warranty issues during this period.

15

Final payment does not occur until after the issuance of the Certificate of Substantial Completion and the approval of the final payment application.

Gaps

- 1 A lack of formalized QA/QC procedures may result in inconsistencies and inadequate deliverables.
- 2 Required hard copy and electronic copy of contract documents create redundancies and inefficiencies in the processes.
- 3 The manual invoice process for the contract specialists may result in inefficiencies and potential errors.
- 4 A significant amount of CIP project communication is conducted over email. At the end of the project, all the emails are uploaded to the appropriate system of record, which may cause inefficiencies in the process.
- 5 Work change directives may be authorized by the PM and work may begin prior to receiving an approved change order. The work may not be approved with the change order, resulting in unapproved work performance.