Rev-1 Nov 26, 2019

**Project Design SOP**

1. **Design Process notes:**
   1. Once a project is approved for execution for a specific budget year the project will be tracked using Maximo and other PM tools by the DPM and EM. Not all projects approved at the budget approval process will have a Maximo WO number. For those that do not have a WO number one will be created prior to starting the design.
   2. It is assumed that a Project Scope Document (PSD) was created and approved during the Programming and Budgeting process. Phase I of the design process will reference this document. If there is no PSD the project should not enter the design process until one is created and approved. The programming process SOP provides details on who to fill out this document.
   3. Cost estimation: Design contingencies used at different stages of design will be as follows:
      1. Concept: Contingency 25~50 % depending on size of projects & the level of details worked at.
      2. Thirty Five % Design: Contingency 15%
      3. Sixty % Design: Contingency 10%
      4. Hundred % Design: Contingency 5%
      5. Final Design: Contingency 0%
2. **Conceptual Design (Phase I):** This phase is started after the project has been approved at the Budget Review Board or has been approved as an insert to the program YR. Inserts must have approved PSD. The DPM will start the conceptual design as follows:

* Scope validation: The DPM will validate the PSD with the Planning Manager (PLM).
  + If the PSD is still valid and we have met with the customer within the last 12 months, schedule a project strategy meeting with the DM.
  + If the PSD needs to be updated or is more than 12 months old, conduct a Customer Meeting to update the PSD.
    - Include PLM, customer representative/s, ESH&Q and a representative from construction group.
    - Minutes: DPM will prepare minutes of the meeting. Minutes will be circulated among participants for concurrence. If there are significant changes to the Requirements, Budget, or schedule (i.e. Cost increases 20%) highlight in the meeting minutes and forward to the EM via the DM.
* Strategy meeting: DPM holds planning meeting with Engineering Manager (EM), Design Manager (DM) and representative from Construction Group. Items for discussion or decision:
  + Engineer & Architect (A/E) vs In-house (I/H): Based on size of project, workload at Facilities, expertize required for the design, and availability of funds for design, a decision to design the project In-house or thru an IDIQ A/E will be made..
  + Scale design process to align with scope of project: Depending on the complexity of the project and design work already done, required milestones for the design and reviews (35%, 60% & 100%) will be decided. BOD must be approved before going to 60% level even if 35% design stage is omitted.
  + Submittal Exchange: Will Submittal Exchange be used for design or for Design & construction?
  + Design Team: Design team should be identified to assist DPM in required area of expertise. The team members will be responsible for I/H design & for review for A/E design documents. For A/E designed projects, the design team members will specifically check drawings, specifications & cost estimate, in their area of expertise.

Specifications: Division 1 specs are to be prepared by DPM. For jobs above $100K normally all applicable sections of Division 1 will be used.

* + ESH&Q engagement: ESH&Q representative should review 35% (if 35% design is among the required milestones) and all subsequent design documents.
  + Schedule: Initiate a MS Project Schedule and include major milestones to include: Design, Commit Funds, Procurement, Execution and Project Close-Out. Consideration must be given if the project construction is SAD dependent. Inter dependence of the project with other projects needs to be considered for proper scheduling.
  + Base on size & complexity of project, decide if separate Construction Manager/SOTR will be needed or if the DPM will fulfill this requirement. Also discuss need for Commissioning Agent, Submittal Exchange, etc.
  + Acquisition strategy: Normal strategy for procurement is technically acceptable low bid based on JLab design documents. Any other process for procurement will need consultation with Procurement Department. Option for executing the job thru BOA subcontractor should also be considered.
  + Reliability:
    - Is this project linked to a critical engineering system? If yes, are there options to increase the reliability of the system?
    - What is the service life of the system or sub-system? Should we replace vs rehabilitate or rebuild?
    - Are there single point of failures with this system that should be addressed in conjunction with this project?
    - Will there be a need for additional critical spares when the project is completed.
  + Minutes: DPM will prepare minutes of the meeting
  + Concurrence: Minutes will be circulated among participants for concurrence.
* I/H or A/E stage
  + I/H Design: DPM & design team (if instituted) will prepare the following for review & approval.
    - Sketches or drawings?
    - Preliminary BOD - (See form/file location reference in Appendix). Budgetary Cost estimate

Depending of the dollar value of the project, the preliminary BOD will be approved by Facilities Director (FD), Engineering Manager (EM) of Design Manager (DM).

* A/E Design: For design thru IDIQ A/E, the DPM will prepare Task Order & fee estimate for request for fee proposal from A/E. (See form/file location reference in Appendix).
* Purchase Requisition (PR): DPM will send PR along with Task Order & Fee Estimate for Request for Proposal (RFP).
  + Pre site visit: A/E team may require a site visit before submitting a proposal.
  + Review RFP from A/E.
  + Award Task order
  + After awarding the design to A/E also award the project to submittal exchange if they are to be used.

1. **Preliminary Design (Phase II: Concept and 35% designs)**

* All designs are to be carried out meeting or exceeding standard codes & Facilities Design Criteria. (See location reference in Appendix).
  + Preliminary Design: A/E of the In-house design team prepares the following:
    - Preliminary Design drawings
    - Budgetary Cost Estimate
    - Preliminary BOD
  + Review of the Preliminary Design:
    - Distribution: Include FD and or EM depending on the size of project, DM & Design Team and User group.
    - Meeting: Discuss the documents in a meeting with all concerned.
    - Minutes: DPM will prepare minutes of the meeting
    - Concurrence: Minutes will be circulated among participants for concurrence.
  + 35% Design
    - Deliverables
      * Drawings describing major elements of the project
      * Basis of Design
      * Schedule for the project including construction.
      * Cost estimate <20%>
      * Check-list
      * List of specification sections
  + Review & Comments
    - Distribution: DPM distributes the 35% design documents to FD, EM, DM, Design Team members, Subject Matter Experts (SMEs), user, facility owner, life safety expert, commissioning agent & ESH&Q.
    - Compilation of Comments: Comments are normally requested to be sent in 8 days. DPM compiles the comments & sorts them with drawing numbers & specification Section numbers for ease of review in the review meeting.
    - Comments Worksheet File: This is to be sent with the documents to receive comments in a comment format.
    - Cost Estimate: Compare the cost estimate with budget. For any significant difference, revise the budget or the scope of work to suit the budget.
    - Reliability: Reviewers should address any reliability issues that were discussed during the conceptual planning phase of the project.
    - Check-list: DPM reviews and approves the checklist for A/E designs. For I/H designs the DPM generates the checklist.
    - Checks that Division 1 specs are current & incorporate changes as per the Division 1 Change Log. See location reference for Change Log in Appendix
    - BOD Review: The DPM will review the BOD and align with the PSD. Deviations will need to be included on the Project Baseline Approval form.
    - Project Baseline Approval (PBA): Depending on cost of the project, the PBA document will be approved by Facilities Director (FD), Engineering Manager (EM) or Design Manager (DM). It will reference:

(1) Project Scope Document (PSD)   
(2) 35% Basis of Design (BOD)   
(3) 35% Design Meeting Minutes   
(4) Project Schedule   
(5) Cost Estimate

* + - Proceed to Next Stage of Design: Sends the following to A/E to proceed with next stage of design.
      * 1. Edited Division I specs to be incorporated with Technical specs sections.
        2. Comments addressed on the 35% design documents.
        3. Approved Basis of Design

1. **Final design (Phase III)**

* 60% Design
  + Deliverables
    - Approved Project Baseline Approval (PBA) document.
    - 35% Design Comment sheet: A/E must complete their response column for 35% review comments.
    - Drawings describing major elements of the project
    - Detailed Cost estimate <10%>
    - Check-list
    - Complete Specifications including Division 1 Sections: Draft of Division 1 sections is to be supplies to A/E by DPM.
* Commissioning Agent: If required for the project, commissioning agent will participate in the reviews starting at 60%.
  + Review and comments
  + Comments Worksheet: See location reference of review worksheet in Appendix.
  + Checks that Division 1 specs are current & incorporate changes as per the Division 1 Change Log. See location reference for Change Log in Appendix
  + Distribution: DPM distributes the 60% design documents to FD, EM, DM, Design Team members, Subject Matter Experts (SMEs), user, facility owner & ESH&Q.
  + Comments Worksheet File: This is to be sent with the documents to receive comments in a comment format.
  + Check-list: DPM reviews the checklist.
  + Compilation of Comments: Comments are normally requested to be sent in 8 days. DPM compiles the comments & sorts them with drawing numbers & specification Section numbers for ease of review in the review meeting.
    - Review: During review, meeting DPM records the comments adopted. The following will be sent to A/E to proceed with next stage of design.
    - Edited Division I specs to be incorporated with Technical specs sections.
    - Approved Basis of Design
* 100% Design
  + Deliverables
    - 60% Design Comment sheet: A/E must complete their response column for 60% review comments.
    - Drawings describing major elements of the project
    - Revised Basis of Design: Any scope changes or items resulting in significant cost changes must be approved again at appropriate level. Other changes may be approved by DPM.Schedule for the project including construction.
    - Detailed Cost estimate <10%>
    - Check-list
    - Complete Specifications including Division 1 Sections: Draft of Division 1 sections is to be supplies to A/E by DPM.
* Review and comments
  + Worksheet: See location reference of review worksheet in Appendix.
  + Checks that Division 1 specs are current & incorporate changes as per the Division 1 Change Log. See location reference for Change Log in Appendix
  + Distribution: DPM distributes the 35% design documents to FD, EM, DM, Design Team members, Subject Matter Experts (SMEs), user, facility owner & ESH&Q.
  + Comments Worksheet File: This is to be sent with the documents to receive comments in a standard format.
  + Check-list: DPM reviews the checklist.
  + Compilation of Comments: Comments are normally requested to be sent in 8 days. DPM compiles the comments & sorts them with drawing numbers & specification Section numbers for ease of review in the review meeting.
  + Review: During review, meeting DPM records the comments adopted. Depending of the dollar value of the project, the reviewed & edited BOD will be approved by Facilities Director (FD), Engineering Manager (EM) or Design Manager (DM). & sends the following to A/E to proceed with next stage of design.
    - Edited Division I specs to be incorporated with Technical specs sections.
    - Comments on 100% design documents.
    - Approved Basis of Design
* DM Project Review:
  + Signed Drawings: DPM arranges drawings to be signed by A/E for A/E designs & also by JLab personnel
  + DM & the design team checks that all comments have been adequately addressed.
  + DPM checks that Division 1 specs are current & incorporate changes as per the Division 1 Change Log. See location reference for Change Log in Appendix.
  + Documents passed on to CM or the SOTR.

Appendix:

* Design Process Map, Manual & SOP and Forms:M:\facilities\Master Documents\Manuals\Design Manual
* A/E Task Order format & Fee Estimates: M:\facilities\Projects\Projects\_100K+\IDIQ – ALL
* Facilities Design Criteria: M:\facilities\Master Documents\Standards
* Specifications & Change Log for Div 1 Specs: M:\facilities\Master Documents\Specifications
* Cost Estimating Guidelines: M:\facilities\Master Documents\Manuals\project management process\cost estimating