

# RECLAMATION

*Managing Water in the West*

## Final Design Process



## **Mission Statements**

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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# Section I. Introduction

## A. Scope

The Final Design Process (FDP) is a guideline document developed under the Design Activities Directive ([FAC 03-03](#)) and Construction Activities Directive ([FAC 03-02](#)). The Design Activities Directive defines team and individual roles in the FDP. The FDP provides guidelines for Design Teams to prepare final designs and specifications.

This document describes a design process used within Reclamation for multidisciplinary designs. This document does not discuss, to an equivalent extent, all design disciplines or design process activities. Discussion of detailed design activities is elaborated where problems have been experienced or where new policies or processes are being initiated.

**Use of all stages and performance of all activities as described in the FDP may not be necessary for projects and designs with a limited scope of work.** For example, a simplified Design Activities Checklist can be found in [Appendix A](#) of the Design Activities Directive.

## B. General

As discussed in this document, the FDP starts before initiation of design data collection and continues through construction to full operation of the facility. The objective of the process is to develop productive working relationships while providing the monitoring and review necessary to produce high-quality and cost-effective designs. Its success is highly dependent on the quality and timeliness of interaction and communication between various organizational segments. In these cases, the Project Management Team (PMT) or Project Leader (PL), along with the client and Design Team Leader (DTL), should determine to what extent the FDP, as described herein, should be used. Reclamation managers, including those persons with delegated responsibility for program accomplishment and managers who provide resources for program accomplishment, are also involved in the process by being accountable for schedules as they relate to funding, resource scheduling, and political considerations.

The FDP consists of a continuous succession of interrelated activities that include scheduling, determining of design data requirements, design data collection and analysis, conceptual designs, final design, determination of acquisition method,

specifications preparation, and construction. (See a flow chart depicting these activities at <http://intra.usbr.gov/~tsc/guidance/design/fdp-chart.pdf>.) These activities may involve personnel in different offices.

Personnel in the various offices must interact with each other throughout the FDP to understand the products and services each requires. The end user, usually a water district or other entity that benefits from the project, has continued involvement throughout the planning and design stages. Even though these stages may take place over many years, the originating office has the primary responsibility to act as Reclamation's representative for soliciting and coordinating the end user's functional and operational requirements. The end user or a representative should be encouraged to attend key milestone briefings throughout the design process to insure the orderly development of the project around project needs. Also, this involvement will provide the end user with an understanding of alternative methods of achieving their needs and provide them within an awareness of the initial cost versus life-cycle decision process.

Frequent monitoring and updating of the schedule and the flag dates by the Design Team will be required. An updated schedule will be made available for Design Team and management review at specific milestones.

Major design milestones and reviews associated with Architect-Engineer (A-E) designs should be scheduled in a manner similar to "Reclamation" designs. However, scheduling of work activities will be the responsibility of the A-E.

The Safety of Dams – Project Management Guideline (March 2003) describes how a Dam Safety Corrective Action Study ties into the FDP. It states: "Based on the findings from the Corrective Action Alternative Report of Findings (ROF), the Dam Safety Office and region and area office formulate and document if a project should continue with modification report and final design activities and what options should be pursued. This step is equivalent to a CONCEPTC milestone." While useful design data are often developed during these stages of the Dam Safety Process, that process should be considered as preliminary to the FDP in terms of scope and complexity.

Therefore, while final designs for dam safety modifications will follow the processes outlined herein for activities after the CONCEPTC milestone, these projects will require additional refinement of design concepts between CONCEPTC and DESIGNC milestones. Design activity schedules and budgets should reflect this level of effort.

### **C. Ongoing Coordination Activities**

The FDP describes activities of the design team with measurable milestones, many of which require ongoing coordination activities involving various offices

and activities. The schedule and budget should be continuously monitored by the DTL. Reclamation managers should monitor resources and be aware of progress in their groups. Between milestones, there should be communication whenever required between the Design Team, PMT, PL, and/or the originating office. The Design Team should also seek assistance, as needed, from the office in their organization that assists with project management and budgets. The acquisition office should be involved in the FDP to ensure that a decision on the contracting method is made early in the process, at a minimum prior to the DRAFTSPEC milestone. Communication among offices is important, and any issue should be made known as soon as possible to allow the most time for resolution.

Ongoing coordination activities which may occur at any time and be independent of each other include: monitoring and revising budgets and schedules, PMT or PL involvement, resource management activities, originating office activities, Design Team activities, project management and budget office activities, and security issues.

## **Section II. Scheduling and Milestone Events**

The FDP is accomplished within the framework of the scheduling and approval processes. Good scheduling provides a clear picture of the work to be accomplished, a means of determining the required resources, a tool for monitoring work progress, and an assessment of the effects of changes or additions to the work. The plan-design-construct process emphasizes developing and maintaining schedules based on the best information available. The Design Team should utilize assistance from within their support organization to assist with project management/budget tracking and reporting. (For examples and guidance see the [TSC Project Management site](#) on Reclamation's Intranet.)

### **A. Scheduling**

The Design Team is responsible for developing the design schedule and obtaining agreement with the involved organizational units on activities, duration, and resource requirements. The Design Team adjusts activities to achieve or maintain a schedule that meets client needs and is consistent with available resources. With changing conditions, the schedule and/or resource allocations may change. When a delay is anticipated, alternatives such as acquiring resources from other organizational units, changes in flag dates, or contracting should be considered.

Those involved in developing schedules or making schedule adjustments must recognize program, funding, resource, and political considerations. The amount of effort required to develop a schedule is commensurate with the stage and size of a job. If a job is in the initial stages of development and small, the schedule may be simple. For large, more complex jobs, the Design Team and Reclamation managers need more detailed schedules to determine resource needs and allocations, and prepare resource requirements and schedules as related to their dependent tasks.

## **B. Stages and Milestone Events**

Milestones have been designated at key points in the design process. These milestones, which are common to most designs, usually occur at major decision points when Reclamation managers/design team/client concurrence is required. Milestone decisions are usually documented by a Milestone Decision Memorandum. (See Appendix 1 for an example.) Stages consist of the multiple activities needed to achieve a milestone.

Designated milestones are goals that every Design Team must strive to meet. If a milestone cannot be met, the DTL must inform the client as soon as the delay is recognized. Together, they will recommend whether to:

- Proceed with the activities that follow a milestone without all of the requirements being met.
- Slip the milestone and all subsequent milestones to provide a more realistic schedule.
- Assign additional resources to complete the work on time.

Following is a discussion of the FDP in terms of the important stages, milestones, key activities, and roles of the principal participants.

### **STAGE: PREWORK—Request Work and Establish Funding Source**

The PREWORK Stage precedes the actual start of design work on a given job. The work may be shown on program or budgeting documents as potential work. A PMT may be established or a PL assigned by the originating office. To meet the START milestone, the client should have identified the general work to be performed, a proposed schedule, and the funding source. Upon review of this information and agreement to perform the work, the originating office will establish and open a cost account, and a DTL is assigned.

### **MILESTONE: START**

The START milestone will be met and the SCHED stage will begin when the cost account is opened signaling that the Design Team can begin work.



**START Milestone Checklist**

1. General work identified and work request submitted
2. Proposed schedule developed
3. Funding source confirmed
4. Cost account opened
5. PMT established as needed
6. PL and DTL assigned

**STAGE: SCHED—Scheduling, Staffing, Defining Design Data Requirements**

The SCHED stage includes development of a Design Activity Plan which includes the scope of work, schedule of activities, definition of required resources, and establishes design requirements and other major activities to develop the final designs.

The initial design schedule and estimated design cost to CONCEPTC, or when possible, through SPECB, should be presented by team members and Reclamation managers for approval. Agreement with the scope of work and schedule signifies that the DESIGNACTIVITYPLAN milestone has been reached.

The Design Team will develop a Communication Plan. For items to be considered in a Communication Plan see Appendix 2.

The Design Team will define initial design data requirements, including the geological/geotechnical design data, and establish the data submittal schedule. The Geologic Exploration Team, under the guidance of a Principal Geologist, if required, will coordinate formulation and accomplishment of exploration programs for geological/geotechnical design data. The Design Team will identify and request special studies such as seismotectonic or hydrologic studies. The Security Office or regional security coordinators should be contacted by the Design Team early in this stage to determine the potential for security issues to be addressed in the work as well as identifying any data needs to address these issues. Since design data collection is usually a time consuming activity, it is important to define initial design data needs early in the project, responsibility for collecting the design data, and the schedule for collection. Design data submission should be as early as possible. Design data collection should normally begin before the DESIGNACTIVITY PLAN milestone with Design Team, originating office, and client staff involvement.

The product of the initial client/Design Team meeting should be a Design Activity Plan, submitted to the PMT or PL for approval. The Design Activity Plan should include a description of the design data collection activities, responsible entities, and a schedule. Design data collection and

periodic submittal dates must be incorporated into the design schedule. Field staff and the Design Team should establish priorities of design data requirements so the investigations focus on collection of the data that would most influence the concept selection.

CMP (Construction Management Plan) initiated. Microsoft Project® schedule templates may be downloaded from the TSC intranet at <http://intra.usbr.gov/~tsc/guidance/design/FDPtemplates.html>.

**MILESTONE: DESIGNACTIVITYPLAN**

The Design Activity Plan is approved by the PMT or PL.

**DESIGNACTIVITY PLAN Milestone Checklist**

1. Design Activity Plan approved
2. Design data requirements identified
3. Geologic data requirements identified
4. Design Team roster confirmed

**STAGE: CONCEPT—Conceptual Design**

During this stage, most of the design data are collected, analyzed, and used in evaluating alternative concepts for meeting project requirements. Data collectors and the client should frequently interact with the Design Team members as concepts are revised or rejected and additional design data needs or resources are identified. Through this interactive process, design concepts and associated costs will be compared and narrowed to one for recommendation to the PMT or PL.

A variety of design data elements are gathered, tested, assessed, and documented during this stage. The following list includes critical activities completed during this stage that are common to many projects:

*Design Data*—All design data that impact selection of the final design concept should be submitted before the concept design data date, and a firm schedule for collection of remaining data, including the appropriate commitment of resources, should be made at CONCEPTC. A comprehensive design data file should be established and maintained throughout the project with updates and additions as they occur and a final report should be prepared when all design data are collected. The Design Team will review the entire data package for completeness and accuracy and identify any missing components 1 month prior to CONCEPTC. The originating office will respond with an Accountability Report and will certify the completeness of the package. Risks or potential impacts related to preparing the design with the available data should be presented to the PMT or PL.

*Field Exploration*—During this stage, a field exploration request is transmitted and an initial Geologic Design Data Report is prepared and submitted for use 1 month before CONCEPTC. However, this should not limit preliminary data from being submitted on a regular, ongoing basis. This report will provide necessary information to begin detailed design, including indication of additional exploration or studies required and must be updated during the final design stage, as appropriate.

*Materials Testing*—The design of any structure is dependent on the engineering properties of the materials forming or supporting the structure. Materials testing during the design process require close coordination.

An effective laboratory testing program requires that: (1) the samples received are representative of the materials and conditions at the site, (2) the samples are of appropriate quality and quantity and are properly preserved and transported, and (3) the sampling and testing are scheduled into the design process.

Time required for laboratory testing will vary depending on the nature of the material being tested, the types of tests, the complexity and magnitude of the program, and the availability of staff and equipment required to perform the testing. A sufficient period of time for testing and report preparation should be included in the schedule of design data collection activities so that design parameters are available at the appropriate time.

Responsibility for testing to determine the engineering properties of material responsibilities are:

- Schedule and coordinate sampling and laboratory and field testing activities with field exploration and design activities.
- Provide input into the field exploration or sampling program so that quality representative samples of appropriate size are received in the laboratory.
- Ensure that the testing is completed and the data are available for use in design.

At this stage, laboratory reports reflect the data obtained and used in the conceptual designs.

In addition to field data collection and analysis, other technical studies and activities completed during this stage include:

*Hydraulic Studies*—The need for hydraulic studies should be determined and scheduled during this stage.

*Cost Estimate and Schedule*—Just as it is important for the Design Team to be involved in the planning and review of design data collection, it is important for the originating office and construction management office to provide input on schedule, performance requirements, and constructibility. 30-percent-design-level cost estimates are required to select viable concepts or update existing estimates. A minimum of 3 weeks should be allowed for this estimate preparation. The overall schedule through construction is updated during this stage.

*Determine Acquisition Method*—The type of acquisition should be determined during this stage.

*Technical Memorandums (TMs)*—TMs are identified by the Design Team. Drawings and sketches prepared during this stage must be sufficient to portray and evaluate the various concepts and technical features and develop quantities. Typical drawings may include architectural outlines, general plans, or switching diagrams.

*Value Engineering (VE)*—VE studies and the Design Team's responses in an Accountability Report should be completed using concept information on all designs for estimated construction contracts more than \$500,000. These studies should be accomplished close to CONCEPTC so that recommendations can be incorporated before DESIGNC. Reclamation Manual Directives and Standards CMP P05 and CMP 06-01 provide details of the VE program requirements.

*Other Activities*—During the CONCEPT stage, the membership of the Design Team may change as alternatives are studied and different disciplines are required. The Design Team membership should be firmly established by completion of CONCEPT. The Design Team, management, and clients must evaluate alternative concepts and VE studies and recommend the alternative that best accomplishes the project requirement. Throughout this stage, the line organization provides assistance and direction to the Design Team concerning technical adequacy and that all standards and codes are met that are applicable to the design.

*Security*—Near the end of the CONCEPT stage, the Design Team should complete the attached brief questionnaire in Appendix 3 to determine if the Security Office or regional security coordinators should be involved in further review of the work and to determine the involvement required during the remaining stages of the design. A security review will ensure the planned work will not increase security risks at the facility and that appropriate security-related safeguards are incorporated into the final designs. This review should be arranged with Reclamation's Office of Security, Safety, and Law Enforcement or regional security coordinators

with the review performed by the Security Office staff, regional security coordinators or by designated staff knowledgeable in security protective measures.

**MILESTONE: CONCEPTC**

At CONCEPTC, the specifications activities are about 30 percent complete, and formal concurrence through a Decision Memorandum is required. All viable concepts should be presented. A concept briefing package should be prepared containing general arrangement drawings, typical sections, single-line diagrams, and operating descriptions. Construction right-of-way requirements and agreements with clients, railroads, utilities, electrical power suppliers, highway, and other involved agencies should be assessed, and schedules for remaining data collection and the design flags adjusted, as appropriate.

A concept briefing meeting should be held with the PMT or PL, Reclamation managers, and end users. All parties should agree on the concept, schedule, and costs before continuation of designs.

**CONCEPTC checklist**

1. Design data reviewed and request for outstanding data submitted
2. Geologic data reviewed and request for outstanding data submitted
3. Request for Lab Data submitted
4. Draft Lab testing reports submitted and reviewed by Design Team
5. Plans and schedules for hydraulic modeling (if needed) are submitted and reviewed by Design Team
6. General plan/arrangement of concept alternatives
7. Thirty-percent-design cost estimates
8. Acquisition type determined
9. Revised Design Activity Plan
10. CONCEPTC Decision Memorandum and briefing

**STAGE: DESIGN—Final Design**

The selected conceptual design is refined and the designs completed to the point that specifications preparation can be initiated.

Design data collection, testing, and analysis should be completed during the design stage. In special circumstances, however, interactive design data activities needed to provide more definitive information (especially sampling and testing) may be scheduled for completion after DESIGNC if impacts on design time and design cost are understood and acceptable to Reclamation managers. When it is agreed that the data can be used after DESIGNC, the Design Team should obtain concurrence by a Decision Memorandum.

Specific requirements for accomplishments during the DESIGN stage are as follows:

- The Design Team monitors accomplishments and facilitates coordination.
- TMs identified in the Design Team activity plan are drafted; features such as structures, turnouts, and roadways designed; and borrow, quarry, and disposal areas designated. If not fully identified during the CONCEPT stage, the Design Team identifies additional TMs to be written and revises their activities schedule and resource needs for completion.
- Design schedules are updated.
- All outstanding design data should be received during this stage.
- If the Geologic Design Data Report is supplemented, revised, or amended; these latest data and interpretations are to be submitted at least 1 month before DESIGNC for review and use.
- Specifications drawings and information needed by other Design Team members are shared as needed.
- All equipment is defined, located, and the final configuration for all features agreed upon.
- Quantities and pay items are identified and a list of specifications drawings prepared.
- Final laboratory testing and hydraulic model studies are completed.
- Designs for construction are nearly complete.
- Draft construction logic diagrams are prepared.
- Constructibility reviews are preformed.
- Permit requirements are initiated.

Cost estimates should be revised when major design changes have occurred since CONCEPTC.

***MILESTONE: DESIGNC***

At this milestone the DTL conducts a technical briefing with the Design Team for Reclamation management and clients to review the work and obtain concurrence that all the milestone requirements have been completed and the design stage is complete. The originating office and Design Team Leader may agree that a briefing is not required. At DESIGNC, specifications activities are about 60 percent complete and a Decision Memorandum signifying concurrence is required whether or not a briefing is held.

DESIGNC occurs when all design data have been received and a design data report prepared, or when the lack of design data will not have an impact on the design schedule. The DESIGNC milestone cannot be met if tasks outlined by the design team activities schedule and the general requirements below, which are critical to the design schedule, are not met.

If some tasks can be deferred until after DESIGNC, the schedule and resources required to meet timely SPECD accomplishment must be revised and agreed to. If resources are not available to meet the revised schedule, then the SPECD date should be delayed.

**DESIGNC checklist**

1. VE study completed and accountability report prepared
2. Outstanding design data received
3. Lab testing completed and draft reports received
4. Preliminary drawings completed
5. Pay items for specifications and list of drawings completed
6. Updated geologic design data report prepared
7. Draft Technical Memorandums prepared (TMs)
8. Draft Construction Logic diagrams prepared
9. Constructibility review performed
10. Draft construction schedule(s) prepared
11. DESIGNC decision memorandum and a briefing is held if required

**STAGE: DRAFT SPEC—Preparation of Draft Specifications**

The product of this stage is the draft specifications (including technical paragraphs and drawings).

Specifications sections should be complete, accurate, and signed through “technical approval,” or if not signed through “technical approval” there is concurrence among the Design Team and the specifications writers that there is enough information for specifications preparation to proceed.

**INTERMEDIATE MILESTONE: TASPEC**

The TASPEC milestone is met by delivering the above noted products to the specifications writer 5 weeks before SPECD or as determined by the Design Team. This will allow for the Design Team review before the SPECD flag.

**TASPEC checklist**

1. Complete draft specifications through technical approval

A draft of the Design Summary is completed by the Design Team, and the Government-furnished construction logic diagram revised. Design Team members are provided the draft specifications sections for review 2 weeks before SPECD. If the total draft package is not complete at this point (i.e., coordinated specifications, bid schedule, list of drawings, quantities, and drawings signed through “technical approval”), the originating office must be notified by the DTL that the draft specifications are not complete. The DTL will determine, with the originating office and appropriate team member concurrence, whether to: (1) postpone SPECD and establish a

new “Anticipated Schedule,” or (2) send the specifications draft “as-is” for review at the scheduled SPECD date. A Decision Memorandum or appropriate correspondence should be prepared if the total draft package is not complete. The Design Team is responsible for ensuring line organizational review of draft specifications and incorporation of their comments before SPECD.

The lead specifications writer will send a formal notice of the REVIEWC meeting to the reviewing offices at SPECD. The lead specifications writer will also distribute the draft specifications package and TMs to the reviewing offices.

**MILESTONE: SPECD**

At SPECD, the specifications activities are about 90 percent complete. SPECD is reached when the draft technical paragraphs and prints of drawings signed through “technical approval” are sent to the reviewing offices, originating office, and the contracting office as required.

**SPECD checklist**

1. Lab testing reports completed
2. Specifications through technical approval submitted to specifications coordinator
3. Specifications sent for review
4. Formal notice for REVIEWC meeting distributed
5. Technical memorandums finalized and approved
6. Quantities and bid schedules complete
7. Draft design summary complete
8. For RFPs, develop Technical Evaluation Criteria with input from the originating office, construction management officer, and contracting officer (CO)

**STAGE: REVIEW—Specifications Review**

The technical paragraphs and drawings must be critically reviewed both before SPECD and during the review process. A thorough review of issues and changes will reduce the number and size of amendments and produce a quality product that can be constructed at a reasonable price and with minimal changes. Reviewers should be the Design Team and appropriate decision makers as identified by Reclamation managers, i.e., Construction Engineer (CE), Regional Engineer, and Contracting Officer (CO). The end user may attend if it is determined appropriate by the originating office. Each office should review, in advance, the material provided and come to the meeting with their concerns identified and comments consolidated.



**MILESTONE: REVIEWC**

A final design and specifications review meeting and briefing will start approximately 2 weeks after SPECD. One week should be scheduled for this meeting. This meeting will be the key to agreement between all parties as to the final specifications content.

The final specifications review meeting will be the forum where final input and decisions are made resolving all issues. A thorough review of issues and changes will reduce the number and size of amendments. Significant changes suggested in the solicitation/specifications should have a written explanation. If the specifications have extensive changes, the need for another REVIEWC meeting will be determined.

While distribution of most electronic drawing files during the bid phase will be limited to PDF format, both Reclamation and prospective contractors would benefit from providing bidders/offerors with DWG format files for certain project features. Specifically, drawings which depict excavation and backfill limits or earthwork pay lines and concrete outline drawings could be used by bidders to more accurately estimate quantities for those aspects of a project thus improving the quality of bids for those project features.

A recommendation by the Design Team and CE of drawings that may be made available in electronic medium to bidders/offerors and the contractor should be developed during the final specifications review and identified at the REVIEWC meeting. This recommendation should be transmitted to the CO along with the specifications package. If the CO concurs with the recommendation, the procedures for Transfer of Electronic Drawings, Chapter 7, Drafting Standards, should be followed.

The final review meeting will be conducted by the DTL with Design Team members and others, as necessary. A master copy of the specifications paragraphs is maintained by the lead specifications writer to consolidate comments. The DTL prepares final review meeting notes that list areas of discussion, schedules, and individuals responsible for follow-up actions. The meeting notes are signed by attendees and are included as an enclosure to the REVIEWC Decision Memorandum. The REVIEWC briefing requires preparation of a Decision Memorandum to include all issues that remain outstanding, identification of responsibility for resolution, and time required to maintain the schedule. The Decision Memorandum is to be signed by DTL and client representative indicating concurrence. Completion of these activities meets the REVIEWC milestone.

**REVIEWC checklist**

1. Comments on specifications received
2. REVIEWC meeting held
3. List of drawings to be made available in electronic format finalized
4. Final design briefing and REVIEWC Decision Memorandum which includes:
  - a. Final design schedule
  - b. Explanation of changes
  - c. Outstanding items and responsible parties

**STAGE: FINAL SPEC—Final Specifications and Design Summary**

The lead specifications writer and Design Team will revise the draft specifications incorporating all agreed-upon changes after the REVIEWC meeting. The drawings and technical paragraphs are completed and signed through peer review. The composite final draft Design Summary with all final TMs are to be complete. Final quantities are completed and the prevalidation estimate is prepared. Final technical paragraphs and drawings in PDF are sent to the CO.

**MILESTONE: SPECB**

Completion of the above noted activities meets the SPECB milestone.

**SPECB checklist**

1. Final quantities completed
2. Funding requirements (prevalidation estimate) furnished
3. Final specifications completed and sent to contracting office
4. Technical Evaluation Criteria furnished to CO

**STAGE: BOOKPRE**

The solicitations package is printed (via hard copies and/or electronic media) and prepared for distribution.

**MILSTONE: BOOKC**

The solicitations package is complete and ready for distribution.

**BOOKC checklist**

1. Book issued
2. Presolicitation notice issued by the contracting office

**STAGE: BID (IFB and RFP)—Acquisition Process**

During the acquisition process, the Design Team has a significant role in working with the contracting office (CO), the CE/CM, construction staff, and sometimes prospective bidders/offerors through the CO in clarifying

aspects of the design and specifications and preparing specifications amendments. The Design Team is responsible for providing technical input to the CO for preparation of amendments to the specifications.

**MILESTONE: BIDC**

Bids/offers are opened by the contracting office and/or contract negotiations are completed.

<p style="text-align: center;"><b>BIDC checklist</b></p> <p style="text-align: center;">IFB</p> <ol style="list-style-type: none"><li>1. Engineer's estimate (IGCE) completed and provided to contracting officer</li><li>2. Design summary completed</li><li>3. Specifications amendments issued</li><li>4. Prebid information meeting conducted by the contracting office and the design team</li></ol> <p style="text-align: center;">RFP</p> <ol style="list-style-type: none"><li>1. Engineer's estimate (IGCE)</li><li>2. Technical proposals evaluated by TPC</li><li>3. Cost proposal evaluated by CPEC</li><li>4. Negotiations conducted</li><li>5. Request for final proposal</li><li>6. Specification changes and amendments completed</li><li>7. Design summary completed</li><li>8. Technical response input to protests</li></ol>
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**STAGE: AWARD**

The acquisition staff completes the steps necessary to award the contract.

**MILESTONE: AWARDC**

The successful bidder/offeror is awarded the contract by the contracting office.

<p style="text-align: center;"><b>AWARDC checklist</b></p> <p style="text-align: center;">IFB</p> <ol style="list-style-type: none"><li>1. Bid opening completed</li><li>2. Bid evaluation completed</li><li>3. Contract awarded</li></ol> <p style="text-align: center;">RFP</p> <ol style="list-style-type: none"><li>1. Report on final proposal prepared</li><li>2. Contract awarded</li><li>3. Debrief offerors</li></ol>
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**STAGE: CONSTR—Construction:**

**A. General:** During construction, the Design Team provides technical support functions to the construction staff and the CO. Some of these functions are:

- Furnish drawing revisions.
- Perform technical reviews of contractor's submittal for approval.
- Inspect and provide technical acceptance of instrumentation and monitoring equipment installations.
- Prepare design changes to reflect actual field conditions or unforeseen design requirements.
- Provide technical assistance to solve issues that arise during construction.
- Provide technical analysis of contractor's claims.
- Perform factory inspection of manufactured equipment and assist in equipment installation and startup.
- Approve all changes to the design or technical requirements of the specifications.
- Assist in geologic mapping of surfaces exposed during construction.

**B. Foundation Acceptance for Structures:** One of the more critical aspects of the Design Team's responsibilities during construction involves foundation inspection and acceptance for structures. Foundation acceptance for structures other than dams and appurtenant structures may be delegated to the CE. In such cases, the project construction staff will inspect and document foundation conditions, and immediately communicate unexpected or questionable conditions to the Design Team.

After a significant portion of the foundation is exposed and geologically mapped, appropriate Design Team representatives will thoroughly examine the foundation for conformance with design intent and determine any treatment necessary to prepare the foundation for fill or concrete placement. The Design Team representatives will prepare a Decision Memorandum on foundation acceptance referencing available maps, photographs, and/or video tapes. If required, the Decision Memorandum should contain stipulations concerning additional work that must be completed before fill or concrete placement. See Appendix 4 for a sample outline for a Decision Memorandum.

The foundation acceptance process will incorporate areas as large as practicable to reduce travel and paperwork, but will be repeated as often as necessary to ensure that the design intent is accomplished for the entire foundation. Foundation acceptance for dams and other major structures by Design Team representatives should be based on first-hand knowledge, and, therefore, cannot be delegated. However, during the foundation

acceptance process, the DTL and CE/CM should develop a method whereby the Design Team representatives do not have to visually examine the foundation in its entirety, but can, where conditions are similar, base their approval on communication with the construction staff by means of telephone, photographs, video tapes, or geologic maps. The Design Team representatives must, however, physically visit the site frequently enough to fulfill their responsibility of ensuring that the conditions revealed by foundation excavation do not differ substantially from what was expected during design and that construction procedures will accomplish the design intent. Likewise, the CE/CM will consult with the Design Team leader and, as appropriate, the principal geologist regarding critical construction activities, and events (examples: foundation inspections, changed conditions, contractor proposals, etc.), to ensure the intent of the design is achieved and adequate quality control/quality assurance measures are implemented.

Each foundation acceptance will be documented by a Decision Memorandum. The Decision Memorandum will be signed by the Design Team members who are accepting the foundation. The CE/CM or a designated representative will sign the Memorandum concurring that the foundation has been prepared and treated according to the specifications and that additional work identified in writing by the Design Team will be performed. If the acceptance of a foundation area is by telephone, the Foundation Acceptance Decision Memorandum will be the same except CE/CM concurrence will be obtained by telephone and so noted. The Decision Memorandum will be prepared before the Design Team members leave the project or immediately after foundation acceptance by telephone, and distributed to all interested parties within 2 working days. Copies will be sent to all involved Design Team members, the PMT if formed, the CE, and DTL files. Those who receive copies of the acceptance reports should immediately bring any concerns to the attention of the Design Team. For an example of a Foundation Inspection Decision Memorandum, see Appendix 4.

After acceptance of the entire foundation for a new dam or existing dam modification, the DTL and PG should prepare a Foundation Acceptance Summary Memorandum. The Memorandum should summarize data from all Foundation Acceptance Decision Memorandums and verify completions of the foundation acceptance process.

**C. Completion of Work:** The activities involved in accomplishing construction must be incorporated into the construction schedule developed by the contractor. As with the design schedule, the construction schedule must be detailed, accurate, and up to date. This is the contractor's responsibility, but the design staff must work with the construction staff to review progress of the work and monitor the

construction schedule. The importance of good scheduling cannot be overemphasized.

The CE/CM maintains frequent contact with the Design Team and provides information to the Design Team regarding field problems. Design Team members will visit the construction site periodically and at certain designated events, such as foundation acceptance.

Shortly before the construction work is accepted as substantially complete, the CE/CM, in conjunction with the DTL, will compile a listing of all outstanding requirements that have not been completed.

Included on the list will be contractual items (drawings and data, warranty inspections and documentation, etc.), and noncontractual items (Design Summaries, Technical Memorandums, Filling Criteria, Required Monitoring, As-Built Drawings, etc.). A copy of the contractual items list will be provided to the CO. When the construction work is accepted as substantially complete, the CO prepares a letter to the contractor accepting the work as substantially complete and informing him/her of the outstanding contractual items.

***INTERMEDIATE MILESTONE: SUBCOMP:***

When the CE/CM accepts the work under the specifications as substantially complete, the SUBCOMP milestone date is considered to have been met.

**SUBCOMP checklist**

1. Technical assistance provided to construction staff
2. Technical revisions reviewed
3. Factory inspections are completed
4. Acceptance and performance testing completed
5. Design verification activities completed
6. Prepare punch list for work completion

Completion of all RSNs is verified, as-built drawings are prepared, completion punch lists are prepared, equipment operation is verified, and warranty inspections are completed.

***MILESTONE: CONSTRC***

Completion and acceptance of all work under the specifications as complete (pending resolution of claims) meets CONSTRC.

**CONSTRC checklist**

1. All RSNs are complete
2. As-builts complete
3. Assist in equipment checkout and startup
4. Acceptance of all work as complete
5. Close cost accounts as necessary
6. Formal briefing

**STAGE: COMP—Complete Contractual Requirements**

Claims are analyzed and settled, final report of construction is prepared, and all cost accounts are closed. When all work under the contract has been completed, the CO prepares a letter to the contractor accepting all work as complete.

**MILESTONE: COMP**

All work is accepted, all claims are settled, and the CO officially releases the contract.

**COMP checklist**

1. Analysis of claims
2. Provide expert testimony
3. Assist in startup and O&M
4. Acceptance of construction/release of claims received
5. Assist with final inspection
6. Completion date shown on schedules





**Appendix 1**  
**BUREAU OF RECLAMATION**  
**Milestone Decision Memorandum**

**Date:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**Information:** \_\_\_\_\_  
(Includes items like regions, features, end users, project)

**Milestone:** \_\_\_\_\_  
\_\_\_\_\_

**Subject:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Names of Participants:**  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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**Issues:**

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**Concurrence Signatures:**

**Possible List of Concurrence Signatures**

1. PMT representative or PL
2. Originating office representative
3. Key Reclamation managers such as DTL manager, geology manager, and managers from key design units.
4. End user representative
5. Regional Engineer
6. CE/CM



## Appendix 2

### DESIGN TEAM — COMMUNICATION PLAN

#### Description

A communication plan identifies the people and organizations with an interest in the project (stakeholders), communication needs, and methods of communication. The plan will establish the communication channels, procedures and expectations that will keep stakeholders appropriately informed of the status and progress of the project. Communication planning helps to ensure that everyone who needs to be informed about project activities and results gets the needed information.

#### Who develops a Communication Plan?

The project leader is responsible to identify communication needs and to decide whether a formal communication plan is needed for the overall project. The design team leader should address a communication plan in the design activity plan.

#### What kinds of projects need a Communication Plan?

Each project will have unique communications needs. Projects of long duration will benefit from formal planning because the project stakeholders are likely to change over time. Projects of short duration will benefit because issues need to be identified and resolved quickly in order to meet a short schedule. Projects that affect a large number of people or organizations may also benefit from formal planning to ensure full identification of both stakeholders and of communication needs.

#### Guidelines

A communication plan needs to address the following items as appropriate to the size and complexity of the project:

- **List of Stakeholders.** Who has interest in the project? Examples are design team members, the project leader from the Reclamation project/program office coordinating the project, Reclamation line management with staff working on the project, the project manager or designated contact representing the non-Reclamation client (i.e. end user or other non-Reclamation entity with an operational or financial role in the project) and other involved government agencies. Be sure to include both financial and technical stakeholders.
- **Information Needs.** What kinds of information about the project are of interest? Establish appropriate distribution of plans, status and progress reports, change orders, meetings, conference calls, major events, availability of prototypes and demonstrations, etc.
- **Purpose.** The reason for the distribution of these information items.
- **Frequency.** How often information will be distributed.

- **Start and end dates.** The time frame for distribution of information items.
- **Communication Process.** What information will be communicated to what groups in what ways? Common methods include reporting and documentation, email, meetings, and web sites.
- **Responsibility.** The team member charged with the distribution of information.

As stakeholder requirements and input are identified and resolved, the issues and the measures taken to resolve those issues should be documented. The documentation can be in the form of an issue log; documentation to phone calls, e-mails, or meetings; or a formal decision memorandum depending of the complexity of the decisions. The following should be considered when documenting decisions:

- **Resolved issues.** These include things like scope of work changes, resource issues, budget and schedule changes, and issues that arise during the design of a project.
- **Approved change requests.** When changes are approved, how these changes will affect the design activity plan.
- **Approved corrective actions.** These include changes that bring the expected future performance of the project in line with the design activity plan.
- **Design Activity Plan Updates.** The design activity plan is updated to reflect the changes made to the communication plan.
- **Lessons learned.** Lessons learned are documented so that they become part of the historical database for both this project and the performing organization.

A communication plan template is shown below, or an example of a communication plan for a small project can be found on the TSC PMP form at [http://intra.do.usbr.gov/tsc\\_pm/templates.html](http://intra.do.usbr.gov/tsc_pm/templates.html) under the PDF or Word files for Project Management Plan - Small Project Short Form in section 8. Guidelines on creating a communication plan for a project management plan are found at: [http://intra.do.usbr.gov/tsc\\_pm/2.8\\_definition.html](http://intra.do.usbr.gov/tsc_pm/2.8_definition.html). The original communication plan and associated decision documents shall become a part of the project files and be kept in accordance with the Records and Information Management Directive RCD 05-01.

**BUREAU OF RECLAMATION**  
**Design Team Communication Plan**

**Project:** \_\_\_\_\_

**Date Implementation:** \_\_\_\_\_ **Revision Date:** \_\_\_\_\_

**List of Stakeholders and Contact Information:**

(Include names, position/titles, e-mail, phone numbers and addresses)

**Information needs/Frequencies/Responsible Person:**

Possible items:

- Status and progress reports
- Change orders
- Meetings
- Conference calls
- Milestones

**Issues and Resolutions:**

Attach as they arise, and include items such as:

- Issues
- Approved change requests
- Approved corrective actions
- Design Activity Plan updates required
- Lessons learned

**Concurrence Signatures of Stakeholders**

## Appendix 3

### QUESTIONNAIRE FOR SECURITY OFFICE INVOLVEMENT DURING FINAL DESIGN PROCESS

The following questions will provide guidance on the need for contacting the Security Office for involvement prior to the development of final designs and specifications to address any potential security issues:

1. Is the work on a critical asset (a feature of the project that could affect its mission, e.g. dam, spillway, outlet works, powerplant, pumping plant, etc.) and does the loss of the specific item being worked on affect the mission of the facility (the ability to deliver water, power, etc.)? **If “Yes,” then continue.** If “No,” then contacting the Security Office is not needed.

**If you can answer “yes” to any of the following questions for the planned work, either during construction/installation or when the final structure/product is in place, please contact the Security Office (303-445-3197) or regional security coordinators to coordinate their involvement.**

2. Does the work affect the entering or accessing of a specific facility or the methods of operating that facility?

3. Is the design related to the supervised remote control (e.g., SCADA) of a specific facility?

4. Could the work affect the successful operation of security measures already in place, including such items as: barriers, gates, fencing, or other access control systems; door alarms, motion detection, and other intrusion detection systems; CCTV cameras or other monitoring and assessment systems; etc?

5. Will the work potentially allow unauthorized access to critical documents, including those on project operations, descriptions of the potential vulnerabilities or consequences associated with the loss or failure of a specific dam or associated feature of the dam, critical computer source code for SCADA systems or operations software, communication and control procedures for dams or water/power delivery systems, etc?

## Appendix 4

### EXAMPLE OF FOUNDATION INSPECTION DECISION MEMORANDUM

BUREAU OF RECLAMATION  
DECISION MEMORANDUM NO. DEC-\_\_\_\_\_  
DATE: \_\_\_\_\_

\_\_\_\_\_ DAM  
\_\_\_\_\_ MODIFICATION  
\_\_\_\_\_ PROGRAM/PROJECT  
\_\_\_\_\_ STATE  
BUREAU OF RECLAMATION  
SOLICITATION/SPECIFICATIONS NO. \_\_\_\_\_

#### Foundation Inspection Documentation and Approval Report No. 1

**Foundation Inspection Date:** *Insert date.*

**Features:** *Insert feature.*

**Area:** *Describe area.*

**Mapped by:** [Insert name], Geologist

**Participants in Inspection:** [Insert name], Principal Designer, \_\_\_\_ [code]  
[Insert name], Geologist, \_\_\_\_ [code]  
[Insert name], Construction Liaison, \_\_\_\_ [code]  
[Insert name], Construction Inspection, \_\_\_\_ [code]

This memorandum describes the Conditions of Acceptance for the *Insert feature* .

**DESIGN INTENT:** *Describe design intent.*

*Insert feature* **FOUNDATION:**

**Description of As-Excavated Conditions:** *Describe as-excavated conditions.*

**Foundation Geology:** *Describe foundation geology.*

**Geotechnical Considerations:** *Describe geotechnical considerations.*

**ADDITIONAL FOUNDATION TREATMENTS REQUIRED:** *Describe additional foundation treatments required.*

**CONCLUSIONS:** *State conclusions.*

**CONCURRENCE**: Concurrence with the above decision is provided by the following signatures, subject to additional work outlined in this memorandum.

\_\_\_\_\_  
[Insert name], P.E.  
Construction Liason, [code]                      \_\_\_\_\_  
Date

\_\_\_\_\_  
[Insert name], P.E.  
Principal Designer, [code]                      \_\_\_\_\_  
Date

\_\_\_\_\_  
[Insert name]  
Geologist, [code]                      \_\_\_\_\_  
Date

\_\_\_\_\_  
[Insert name], P.E.  
Construction Inspection, [code]                      \_\_\_\_\_  
Date