

# Reclamation Manual

## Directives and Standards

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<b>Subject:</b>	Design Activities
<b>Purpose:</b>	Sets forth the requirements for coordination, process, and performance of design activities. The benefits of this Directive and Standard (D&S) are to ensure standardized design processes among Bureau of Reclamation offices and designs for Reclamation produced by contractors.
<b>Authority:</b>	Reclamation Project Act of 1902 and supplementary acts; Reclamation Safety of Dams Act of 1978 as amended
<b>Approving Official:</b>	Deputy Commissioner, Operations
<b>Contact:</b>	Director, Technical Service Center (DTSC) (86-68000)

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- 1. Introduction.** Design activities are performed within Reclamation to maintain and develop project infrastructure, perform new initiatives, respond to emergencies, and provide technical assistance in support of the agency's mission. Coordination of design activities among all Reclamation offices, including the regional, area, and construction offices, the Technical Service Center (TSC), and the Commissioner's Office is essential to ensure that design activities are performed in a professional, timely and cost-effective manner, satisfying all technical and safety requirements, and are consistent with authorized service agreements between the office performing the design activities and the originating office. Reclamation resources, supplemented as needed, will accomplish Reclamation's design workload in a manner that utilizes existing technical capability, utilizes opportunities to develop sustainable staff capability for the future, and minimizes the dispersion of expertise. Reclamation managers will ensure the utilization and development of Reclamation's design capabilities through the effective use of existing staff resources, collaborative development of work plans that carry out the agency's mission, adherence to and monitoring of corporate business practices, and providing services to non-Reclamation clients as appropriate. Refer to the Final Design Process for detailed information.
- 2. Scope.** These requirements apply to all Reclamation design activities that require the application of engineering principles and practices consistent with Reclamation Manual D&S, *Professional Registration for Engineers and Architects*, HRM 05-01 ([www.usbr.gov/recman/hrm/hrm05-01.pdf](http://www.usbr.gov/recman/hrm/hrm05-01.pdf)).
  - A. Applications.** Design activities may be associated with a multitude of programs, projects, or other activities related to the Reclamation mission, including planning studies, operation and maintenance programs, the Safety of Dams Program, emergency response work, final designs leading to construction, and other technical assistance supporting the agency's mission. Appraisal studies (and design activities in support thereof) are conducted using existing data to make cost estimates and to determine if at least one potentially viable alternative exists, and whether or not to recommend that the project proceed to feasibility-level studies. Feasibility studies (and design activities support thereof) are detailed investigations specifically authorized by law to make cost

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estimates and to determine the desirability of seeking congressional authorization. Final designs are for authorized projects and include enough information to economically construct the project. For design activities, risk reduction objectives and security issues are included when required.

### B. Coordination.

- (1) Coordination of design activities will vary, depending on the size, cost, or other issues. For example, small projects performed under the simplified acquisition authority generally do not require as much coordination as larger more costly projects. Things to be considered are:
  - (a) controversial issues;
  - (b) complex or critical items;
  - (c) new products or technology;
  - (d) dam safety;
  - (e) security issues; and
  - (f) other regulatory requirements like life, safety, accessibility for persons with disabilities, or green buildings.
- (2) Complex items have quality characteristics, not wholly visible in the end product, for which contractual conformance must be established progressively through precise measurements, tests, inspections, and other controls. A critical item is one in which failure could injure personnel or jeopardize the success of the project or a vital agency mission.

3. **Responsibilities.** The following paragraphs define the responsibilities of various positions in Reclamation and the interaction among these positions to ensure successful design coordination and completion of design activities.

A. **Regional Directors.** Regional directors are responsible for accomplishment of Reclamation programs involving design activities within their regions. Regional directors will coordinate with their area managers; regional division managers; power managers; construction managers; the DTSC; and others to accomplish design activities.

B. **Area Managers, Construction Managers, Power Managers, and Regional Division Managers.** Area managers, construction managers, power managers, and regional division managers will perform the work as delegated by the regional director and ensure that the requirements of this D&S are implemented. To aid in accomplishment and coordination, programs are often divided into projects. The office delegated

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responsibility for a project is the originating office for coordination of design activities. If the design activity is not associated with a Reclamation program or project, such as work for other government agencies authorized under the Economy Act, the office delegated the responsibility from the appropriate director for the design activities is the originating office for coordination of design activities.

- C. **DTSC.** The DTSC prescribes the engineering and technical standards and guidelines used to prepare designs to promote consistent application of Reclamation and current industry standards and value engineering practices. The DTSC provides design activity services as requested by the originating office.
- D. **Project Management Team (PMT).**
- (1) The PMT is initiated, for large or critical projects, by the regional director or the person with delegated authority. The PMT is responsible for providing general direction, oversight, and support to design and construction activities (see the Final Design Process). The PMT is responsible for ensuring the execution of an efficient and cost effective project process that affords input from various disciplines, e.g., environmental, contracting, operation and maintenance, etc., to be incorporated into the project activity. Generally the PMT will be comprised of managers representing area, construction, power, region, and Denver offices as appropriate.
  - (2) In the case of projects funded by the Dam Safety Program, the area manager; Chief, Dam Safety Office; and the regional director will appoint the PMT and the PMT will report to these managers (see Reclamation Manual Policy, *Decisions Related to Dam Safety Issues*, FAC P02). A full description of these (and other) aspects of safety of dams project management is available in the Reclamation publication entitled “Safety of Dams - Project Management Guidelines” at: <http://sodis.usbr.gov/dam%5Fsafety/documents/SODPMG1.pdf>.
- E. **Project Leader.** The originating office will appoint a project leader with overall responsibility to coordinate the project. The project leader has responsibility for initiating work on a project and coordinating and monitoring work through project completion.
- F. **Project Team.** The project team is directed by the project leader and may include the leaders of several multidisciplinary subteams that support development of the project. These subteams may include but are not limited to teams that deal with different aspects of the project such as design data collection, field exploration, design, environment, real estate, operation and maintenance, acquisition, and construction. The design team is the subteam responsible for accomplishing design activities for a project. For items for the project team to consider see Appendix A, *Suggested Project Checklist*.

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- G. **Design Team Leader.** The design team leader is responsible for a variety of design and construction support and oversight activities for the project leader. The design team leader, with the support of the design team members, develops the design activity plan which will include identifying resource and data requirements, defining the scope of the work, evaluating alternatives, developing design team budgets, developing service agreements, scheduling the work, and tracking progress. The design team leader will present the completed design activity plan to the project leader or the PMT, whichever is appropriate, for approval.
- H. **Design Team.** The design team functions as a subteam to the project team. For small or less complex projects the design team may be an individual. The primary functions of the design team are to define initial design data requirements; establish data submittal schedule; develop decision memorandum for PMT or project leader; identify and request special studies such as seismotectonic or hydrologic; share technical information; resolve technical issues; coordinate technical activities; develop appraisal or feasibility designs and cost estimates for planning studies or for final designs; and produce a drawing and specification package for the project features with enough information to economically and safely construct the project. The design team operates under the direction of the design team leader and is staffed by personnel from the office(s) providing design services for the project feature. The design team working under the direction of the design team leader is responsible for ensuring that the work receives the proper coordination, technical, and peer reviews; agency program review (such as value program and security reviews); and meets the requirements set by the project leader. The design team will typically consist of a design team leader and representatives of key engineering and scientific groups involved in the development, design, and construction of project features. On teams where a principal geologist is utilized, this design team member will typically reside in the office performing the designs. The construction office that executes the construction contract shall be invited to participate on the design team for final designs leading to construction.
4. **Design Coordination.**
- A. The requirements for coordination of design activities will vary; however, all projects require tracking from inception to completion to ensure that all items on the design activities plan are met. The project leader in conjunction with the office(s) performing the design activities must identify a design team leader. The design team leader will ensure proper coordination with the essential people to coordinate design activities.
- B. For projects that require the formation of a PMT, the PMT will oversee the development of a design activity plan covering all critical elements of the project as described in Paragraph 5.A. The PMT will meet as necessary during the planning and final design phases of a project. At a minimum meetings will be held at the beginning of design data collection, during concept development, during design, and when in final design during the specifications review. The PMT will meet at selected milestones and review actual progress to date. At least five meetings are suggested: one at the

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beginning of design data collection, one during the design process when the 30 percent concept designs are developed during final designs, one during the specifications review conducted prior to solicitation for contract acquisition, one just prior to completion of construction, and one at the completion of post-construction activities. Specific meetings will be determined by the project leader or the PMT. The design team leader will prepare a status report for each meeting that shows the progress of items on the design activity plan.

5. **General Requirements for All Design Activities.** Regardless of the size or complexity of a project, these general requirements must be followed for all Reclamation design activities.

A. **Design Activity Plans.**

- (1) Development of the design activity plan is the responsibility of the design team. Each region will develop their design activity plan checklist. At a minimum, a design activity plan will include a schedule, scope of work, deliverables, budgets, and cost authorities for proper accounting. Requirements for peer review, value analyses, and cost estimating will be included as required by project requirements and/or Reclamation policies.
- (2) This D&S recognizes the distinction between a project plan and a design activity plan. A project plan is a plan for an entire project and includes a design activity plan. When a project includes only design activities, then a design activity plan will serve as the project plan. Large projects, projects with complex features, or projects where a detailed project plan is required must have a design activity plan prepared by the design team and approved by the PMT. For projects without a PMT, the design activity plan is approved by the project leader.

- B. **Service Agreements.** After the originating office agrees to the design activity plan and the design team leader is identified, service agreements will be prepared, as necessary, with the design service providers. These agreements will include the final scope of work, deliverables, budgets, schedules, and cost authorities for proper accounting. An approved, simplified design activity plan will serve as a service agreement for small projects without complex or critical items.

- C. **Design Criteria and Standards.** Design activities must be performed in accordance with established Reclamation design criteria, Reclamation engineering, architectural, or technical standards, and approved national design standards. Exceptions to this requirement will be pursued in accordance with provisions of Reclamation Manual Policy, *Performing Designs and Construction Activities*, FAC P03 (<http://www.usbr.gov/recman/fac/fac-p03.pdf>).

- (1) A copy of this approval shall be provided to the DTSC to allow the developers of future criteria and standards to consider Reclamation practices.

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- (2) The use of these criteria and standards for work performed by others and funded (all or in part) with Reclamation funds will be determined by the director or his/her designee with jurisdiction over the program based on liability, financial, and other applicable issues. If Reclamation criteria or standards are not used on a particular project, the rationale for the decision will be documented in a memorandum from the project leader to the director with jurisdiction over the program or his/her designee. The DTSC will be copied on this memorandum. This information will be used by the TSC staff to consider Reclamation practices in the development of future Reclamation criteria and standards.

**D. Professional Registration.** Professional registration is required for certain Reclamation staff who approve engineering decisions or are in responsible charge of architectural or engineering designs. Reclamation is committed to the highest professional standards of practice as stipulated in Reclamation Manual Policy, *Performing Designs and Construction Activities*, FAC P03 (<http://www.usbr.gov/recman/fac/fac-p03.pdf>). Specific requirements for professional registration are in the Reclamation Manual D&S, *Professional Registration for Engineers and Architects*, HRM 05-01 ([www.usbr.gov/recman/hrm/hrm05-01.pdf](http://www.usbr.gov/recman/hrm/hrm05-01.pdf)).

**E. Design Activities Performed by Others.**

- (1) In cases where a non-Reclamation entity develops designs for an entire project, a specific project feature (e.g., pumping plant, bridge, etc.) or a specific component of a project feature (e.g., electrical controls for a pumping plant, dewatering design for an excavation, etc.), the entity is responsible for the technical adequacy of its design. If the designs meet Reclamation's criteria for preparation by a registered architect or engineer, the entity shall sign the drawing in accordance with the provisions of this D&S, including designation of the signer's registration status. Reclamation participation will involve the appropriate engineering/architectural disciplines (including the individual(s) tasked with signing the drawings "Accepted" as outlined below) in the development of the Statement of Work, product reviews (throughout the development of the designs), and acceptance of the designs. Reclamation professionals are not to provide technical approval of the designs but are to review the information and determine if Reclamation's overall needs are met. This review shall be conducted under the responsible charge of a Reclamation professional registered in the appropriate engineering/architectural discipline. The review will be documented by this registered professional's signature on the drawing signifying the design drawing is "Accepted" with the applicable professional designation after their signature, such as P.E. for professional engineer or R.A. for registered architect.
- (2) In cases where Reclamation contracts for design services for a specific task (e.g., design, drawing production, design checking, peer review, etc.) as part of the design process for a specific project feature or a specific component of a project feature, the individuals from the outside company/organization will be

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responsible for signing Reclamation drawings on the applicable lines of the title block in accordance with all provisions of Paragraph 5.F. Reclamation professionals will similarly document their involvement in the development of the design and drawings by signing the applicable lines of the title block in accordance with all provisions of Paragraph 5.F. In cases where a Reclamation professional's involvement in the development of the design meets the criteria for signing the "Reviewed" line of a Feasibility Design drawing or the "Technical Approval" line or the "Peer Review" line of a Final Design drawing as defined in Paragraph 5.F., the signature of a Reclamation professional on any of those lines will replace the requirement for a Reclamation professional's signature on an "Accepted" line. In all other cases, the "Accepted" line will be included on the drawing and signed in accordance with the provisions of the preceding paragraph.

- (3) In all cases where an outside company/organization is involved in development of a Reclamation design, the role of that outside company/organization as well as Reclamation's role in the development and/or review of the design shall be detailed in the service agreement between the originating office and the Reclamation office providing design and/or review services as well as in the contract with the outside company/organization.

**F. Signatory Responsibilities for Design Drawings.** In order to document the process by which designs are produced in Reclamation, each design drawing will be signed by those directly involved in its development. For purposes of this document, a drawing is defined as a graphical depiction (with notes as required) of a site, feature, object, or concept which is produced to convey engineering, scientific, or other technical information. Signatory documentation will be captured in the signature block and revision blocks of the drawings produced to illustrate the design. Reclamation uses a standard signature block for its drawings as noted in "Information Management Handbook Volume III, Drawing Management and Drafting Standards."

- (1) Feasibility design drawings have design features which are developed for general evaluation purposes only. The designs depicted on these drawings are not of sufficient detail for use in construction or acquisition. Feasibility design drawings have a minimum of two signatures: Designed and Reviewed. Given the impact these feasibility designs have on project cost estimates and ultimately on congressional appropriations, at least one of the individuals signing these drawings must be registered in the appropriate discipline with the applicable professional designation after their signature, such as P.E. for professional engineer or R.A. for registered architect. The responsibilities of those signing each signature line for feasibility designs are outlined below:
  - (a) **Designed.** By this signature, the individual assigned design responsibilities is certifying the preliminary design layout depicted on the drawing is consistent with currently accepted engineering practice and generally satisfies all of the appropriate and available design criteria and data for this

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level of design. This person is also responsible to ensure the drawing conveys a feasible, functional, and compatible concept for all of the critical design requirements.

- (b) **Reviewed.** By signing this line, a person is making an independent review and certifying that there is sufficient detail on the drawing.
- (2) Final design drawings are drawings used in solicitations for construction or acquisition. The responsibilities of those signing each signature line for final design drawings are outlined below:
- (a) **Designed.** By this signature, the designer is certifying the design is consistent with currently accepted engineering practice and incorporates the site conditions as depicted in the design data. The designer is also responsible to ensure the drawing accurately conveys the design intent. The designer need not be registered.
  - (b) **Drawn.** By this signature, the person who developed the drawing is certifying the drawing and the electronic models upon which it is based comply with Reclamation's Drafting Standards.
  - (c) **Checked.** By this signature, the checker is certifying that he/she has completed a detailed review of the design for compliance with currently accepted engineering practice and for incorporation of the site conditions as depicted in the design data. The detailed review includes a check of calculations, tests and methods used to develop the results shown in the document. The checker is also responsible for either personally reviewing the drawing to ensure it accurately conveys the design intent or verifying that this review has been completed by others. The checker need not be registered.
  - (d) **Technical Approval.** The technical reviewer signs the "TECH. APPR." line on the drawing. The individual who signs the technical approval line on the signature block accepts the responsibility for the technical information depicted on the drawing. The individual assuming this responsibility shall have been in responsible charge and intimately involved in the preparation of the design and the drawing. The individual must be familiar with the basic data, criteria, and procedures used to develop the results shown on the drawing. For drawings showing work from several disciplines, it is the signing individual's responsibility to ensure all of the technical information prepared by other professions and disciplines and depicted on the document is compatible with the overall design intent. However, technical approval of design drawings prepared by other professions and disciplines shall be provided by the profession or discipline preparing those design drawings. In cases where the designs depicted on the final design drawing meet the criteria for preparation by a registered engineer or architect, the person



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signing the TECH. APPR. line of a final design drawing signature block must be registered in the appropriate discipline (see D&S HRM 05-01), and is required to put their professional designation after their signature, such as P.E. for professional engineer or R.A. for registered architect.

- (e) **Peer Reviewer/Administrative Approval.** The approved signatory affirms that a peer review or an administrative approval process was performed. The peer reviewer signs the “APPROVED” line on the drawing. The notation “PEER REVIEWER” and the peer reviewer’s title must be added below the signature line (e.g., PEER REVIEWER - DIVISION CHIEF). Alternatively, the “APPROVED” signature confirms that an administrative approval process was performed. The notation “ADMIN. APPROVAL” and the administrative approver’s title must be added below the signature line (e.g., ADMIN. APPROVAL – DEPUTY AREA MANAGER). The differences between these approvals are:
- (i) **Peer Reviewer.** A “PEER REVIEWER” designation on the signature line will be used where this final review is technical. A peer review is a technical quality/assurance control process performed by a professional who is independent of the work performed. It emphasizes a review of the basis of the technical approach; procedures used; and the validity and suitability of the design. The peer review does not normally include a check of calculations, tests, and methods, but does verify that review and checking have been completed by others and are adequately documented. The peer reviewer must possess technical qualifications, practical experience, and professional judgment to properly conduct a peer review and must be an experienced practitioner in the relevant discipline with recognized and verifiable credentials. Therefore, to sign as “PEER REVIEWER” on a drawing that is technically approved by a registered professional engineer or architect, the peer reviewer must also be registered in the appropriate discipline.
  - (ii) **Administrative Approval.** An “ADMIN. APPROVAL” designation will be used where this final review is focused on programmatic, operational, or similar administrative issues. This signature will typically be provided by a facility manager, project office manager, originating office manager, or the project leader, but must be someone familiar with the project needs. Given the more general nature of such reviews, the person signing “ADMIN. APPROVAL” need not be registered.
- (3) Each director under whom final design drawings are produced will develop a procedure to determine the type of review required for each aspect of a project’s design. A minimum of three people must be involved in the development and approval of final design drawings:

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- (a) **Designer.** In addition to his/her design activities, this person may also develop the drawing and provide the technical approval for the design. This person cannot also check the design or provide the peer review or the administrative approval of the design.
- (b) **Checker.** In addition to his/her checking activities, this person may also develop the drawing and provide the technical approval for the design. This person cannot also produce the original design or provide the peer review or administrative approval of the design.
- (c) **Peer Reviewer/Administrative Approval.** This person must maintain their independence from the design development process and limit their involvement to their peer review/administrative review responsibilities.

G. **Technical Approval and Peer Review.** The design team, under the guidance of the design team leader, is responsible for ensuring that proper technical oversight and peer reviews are performed, and that the person providing the technical oversight review of designs is qualified to sign the drawings as technically approved, if required, according to Reclamation Manual D&S, *Professional Registration for Engineers and Architects*, HRM 05-01 ([www.usbr.gov/recman/hrm/hrm05-01.pdf](http://www.usbr.gov/recman/hrm/hrm05-01.pdf)). Reviews will be performed by another Reclamation office, if the office performing the designs does not have the technical capability, if it is more efficient, or the region's delegation of design responsibility requires another office to provide the oversight. Peer review requirements shall be discussed and included in the development of the design activity plan for design and the service agreements.

### H. Signatory Responsibility for Written Specifications.

- (1) In order to document the process by which written specifications are produced and approved, written specifications will be accompanied by a signature sheet. For the purpose of this document, the term "Written Specifications" means the written portion of Section C - Description/specifications of the solicitation. The written specifications do not include the drawings, or the clauses and provisions of the solicitation. For Construction Standards Institute (CSI) formatted specifications, written specifications are Divisions 1 through 16. The signature sheet will contain at least the following:

- (a) Specifications No:

- (b) Specifications Title:

- (c) Project Title:

- (d) Region:

- (e) Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

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(f) Technical Approval: \_\_\_\_\_ Date: \_\_\_\_\_

(2) The person signing the specifications package as “Prepared” shall have developed or assembled the written specifications.

(3) The person signing the specifications package for “Technical Approval” shall have been in responsible charge of the overall design including developing or assembling the specifications. This person will typically be the design team leader. In cases where the designs described by the specifications meet the criteria for preparation by a registered engineer or architect, this person shall be registered with the applicable professional designation after their signature, such as P.E. for professional engineer or R.A. for registered architect. By this signature, this person is certifying the written specifications convey the design intent as portrayed on the drawings included therein. For specifications package containing designs from multiple disciplines, it is the signing individual's responsibility to ensure (using procedures defined by his/her organization) that the technical information prepared by other professions and disciplines and depicted in the document is compatible with the overall design intent and that the documents used to depict that information (e.g., drawings) include signatures with appropriate professional registration designations.

I. **Drawing and Specifications Review.** The drawing and specifications review is the final review of the drawings and specifications paragraphs prior to publishing as a solicitation, to ensure a complete and sufficient document for contracting the work. Review comments are provided to the design team leader by project members, design members, the contracting office, and other involved offices.

J. **Records Retention and Engineering Drawings Management.** Electronic drawing files and records must be retained in accordance with the Information Management Handbook, Volume III, Drawing Management and Drafting Standards and in accordance with Reclamation Manual D&S, *Records and Information Management*, RCD 05-01 (<http://www.usbr.gov/recman/rcd/rcd05-01.pdf>).

6. **Design Activities From Inception to Award.** The design process must follow the design activity plan to ensure the successful accomplishment of design activities.

A. **Flag Dates.** Schedules will be developed for submitting important information like design data and deliverables. The design team leader will schedule progress reviews with the project leader or the PMT, whichever is appropriate.

(1) **Design Reviews.** Design reviews will generally be scheduled at the concept stage of design (at about 30 percent complete), midway through design (at about 60 percent complete), and a final design review (at about 90 percent complete). At the final design review, design drawings and specifications are complete, allowing one last review before they are published. More information on this may be found in the Final Design Process.

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- (2) **Site-Specific Design Criteria.** Site-specific requirements and assumptions need to be determined and documented by the originating office in coordination with the office collecting the design data and the design office. General design criteria will be determined by the design team.
- B. **Design Data Collection.** Adequate design data must be collected and ample coordination must be accomplished to ensure successful execution of design activities. Projects requiring collection of geologic design data demand significant up front coordination among the design team and geologists at the various offices involved. The originating office and the office providing the design services must agree on the required content, degree of detail of the design data, and the schedule for receiving the design data. The data submittal will be reviewed by the design team and supplemental data requests will be made if necessary.
- C. **Deliverables.**
- (1) For appraisal and feasibility studies, the main design product will be an appraisal or feasibility design report containing cost estimates, preliminary designs (if required), and further recommendations. This information may take the form of a technical report of findings including the appropriate decision documents.
- (2) For final designs, the deliverables will generally contain final design drawings, construction schedule estimates, specifications, quantity estimates, independent government cost estimates, design summaries, evaluation criteria when required, and any other information, including the appropriate decision documents, so that the feature can be constructed or contracted for construction. Other deliverables will be listed in the design activity plan or may be required for post-construction activities as described in Paragraph 8.
- D. **Cost Estimates.** At various stages of the project, cost estimates are to be developed to aid in the decision making and value analysis process. The design activity plan will define the required level of estimate and purpose at the various stages of the design process.
- E. **Analyses.** The design activity plan will identify if a value analysis study must be performed and at what stage of the design process (see Reclamation Manual Policy and D&S, *Reclamation Value Program*, CMP P05 (<http://www.usbr.gov/recman/cmp/cmp-p05.pdf>) and CMP 06-01 (<http://www.usbr.gov/recman/cmp/cmp06-01.pdf>). Value analysis must be applied to an overall study to determine the best alternative, but value engineering may be applied to a specific design activity. Projects of more than \$1,000,000 in construction costs require a value analysis study under Office of Management and Budget Circular A-131, and projects of more than \$500,000 in construction costs generally require a value analysis study under Department of the Interior policy 369 DM 1.

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- F. **Revisions.** Revisions to designs after drawings and technical specifications are originally signed will be reviewed by a design team representative (typically the design team leader). In cases where the designs meet the criteria for preparation by a registered engineer or architect, this review will be completed by a design team representative registered in the appropriate discipline and documented by including their professional designation after their initials (e.g., P.E. for professional engineer or R.A. for registered architect). The review of revised drawings must be documented on a revisions block on the drawing as described in the “Information Management Handbook, Volume III, Drawing Management and Drafting Standards.” The review of technical specifications changes will be documented on a signature sheet included with the specifications revisions.
- G. **Design Documentation.** The steps used in the design process need to be documented and filed. This documentation will include a design data package and correspondence, design notes, design calculations, specifications, drawings, and written reports such as the design summary and Designer’s Operating Criteria.
- H. **Critical Path Method (CPM).** The design activity plan for large or complex projects may require CPM scheduling of tasks for the work to be accomplished.
- I. **Pre-award.** The design team must prepare, review, and provide to the contracting office specifications amendments, if required, for all projects in which they are involved, including special construction requirements. Small projects or projects without complex or critical features must be contracted by using simplified acquisition authority, two step sealed bid, or negotiated-type acquisition that requires a Technical Proposal Evaluation Committee (TPEC). At a minimum the design team leader is to be a consultant to the TPEC, and at least one member needs to be registered as required in Reclamation Manual D&S, *Professional Registration for Engineers and Architects*, HRM 05-01 ([www.usbr.gov/recman/hrm/hrm05-01.pdf](http://www.usbr.gov/recman/hrm/hrm05-01.pdf)).
7. **Design Activities From Award Through Construction.**
- A. **Introduction.** Designers must to be available for many activities after contract award. Small projects without complex or critical features may not require as much participation as a large project or those with complex or critical features, but the design team needs enough involvement, including site visits, to ensure that the design intent is being achieved.
- B. **Support During Construction.** The design team must provide a variety of assistance, support, and technical oversight during construction. This will include but not be limited to providing clarification of design drawings, making site visits for field inspections such as foundations, contractor submittal reviews and approval, value engineering, responding to requests for information or clarification, and contract modifications. Large projects or those with complex or critical features will have their own support staff assigned to construction management responsibilities, but for small

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projects without complex or critical features the design staff will also have construction management responsibilities, if necessary.

- C. **Modification of Designs.** Any changes in a feature during construction where there is a deviation from the original design require a technical review by a design team representative who is registered in the appropriate discipline according to Reclamation Manual D&S, Reclamation Manual D&S, *Professional Registration for Engineers and Architects*, HRM 05-01 ([www.usbr.gov/recman/hrm/hrm05-01.pdf](http://www.usbr.gov/recman/hrm/hrm05-01.pdf)). Revisions will be noted on design drawings by a revision block.
8. **Post-construction Activities.** Design activities during post-construction involve reviewing as-built drawings, assisting in the preparation of the construction report and geology report if required, and developing Designer's Operating Criteria. Other post-construction design activities may involve:
- A. participating in Operation and Maintenance (O&M) transfer inspection(s);
  - B. providing input into O&M manuals; and
  - C. reviewing/revising as-built drawings.
9. **Accountability and Documentation.**
- A. The project leader is responsible for overall coordination of the project, and this includes identifying project members who are responsible for planning and design activities, tracking budgets and expenditures, ensuring planning and design activities deliverables meet project requirements, and ensuring proper documentation and records management for the overall project.
  - B. The design team leader is responsible for overall design activities, and this includes ensuring proper accountability of design activities, proper documentation of design products, and proper records management for the design portion of the project.