

Reclamation Manual
 Design Data Collection Guidelines
 Chapter 1 – Introduction

Subject:	Design Data Collection Guidelines
Purpose:	To provide guidelines for Design Data Collection for Reclamation-wide applications.
Authority:	Reclamation Project Act of 1902 and Supplementary Acts, Reclamation Safety of Dams Act of 1978 and Amendments of 1984, National Environmental Policy Act of 1969 (as amended), Reclamation Manual FAC P03, <i>Performing Design and Construction Activities</i> , Reclamation Manual FAC 03-03, <i>Design Data Requirements</i>
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These guidelines provide a comprehensive listing of data to be collected for the preparation of any appraisal, feasibility, or specifications designs performed by or for Reclamation. The guidelines are intended to cover a wide range of project features and to address issues that are critical to successful completion of the necessary design activities. However, unique issues may be encountered for a specific project that will require investigations or data collection not described here.

The size and complexity of the facilities should govern the amount and detail of the design data required. A significant amount of design data prepared for previous studies may be available and should be used for the design. A feasibility report requires sufficient information to determine, with reasonable assurance, that the project will be successful and able to fulfill the repayment contract. For feasibility designs, funding for design data collection is often limited; the critical design data items should be determined and receive maximum attention.

Specification design requires, as a minimum, the same type of basic data as feasibility design. The data are brought up to date and will be addressed in more detail or more extensively.

Communication between designers and project personnel is essential to produce adequate design data. The Project Team and the Design Team will review the data used for authorization and the changes that have occurred since that time. They will then recommend a design data collection program including schedule and budget.

The guidelines will be modified as new issues arise and as new types of project features become more prevalent.

These guidelines are organized as follows:

Chapter 1 “Introduction” - Serves as the introduction and cites the purpose, coordination, scope, and schedule for collecting the design data.

Chapter 2 “Appraisal Investigations – Design Data Collection Guidelines” - Provides guidelines for collection of appraisal investigations design data.

Chapter 3 “Feasibility Design – Design Data Collection Guidelines” - Provides guidelines for collection of feasibility design data.

Chapter 4 “Specifications (Final) Design – Design Data Collection Guidelines” - Provides guidelines for collection of specifications design data.

Chapter 5 “Typical Design Data Package Template” - Provides a template for use in developing a design data package.

Chapter 6 “Sample Design Data Packages” - Provides three example design data packages.

Chapter 7 “Generic Sections” - Provides “generic” subsections (general maps, general description of local conditions, etc.)

References

The design data collected should be sufficient to determine and verify:

- Project purpose and goals
- Scope of the project
- Environmental considerations of the project
- Design requirements of the project
- Operational and maintenance requirements and effects
- Construction considerations
- Construction cost and approximate schedule of the project

1. **Coordination of Design Data Request and Collection.** The design data items are listed to serve as a *guide* for preparing a design data collection program. The design data collection guidelines are applicable for new construction, modifications to existing structures, and replacement of existing structures. Seldom will any given investigation require all of the design data items listed. Design data items should be added as required for a specific project.

The collection and documentation of design data consist of items that may require:

- Work in the field, such as survey data
- Work in the office, such as preliminary analysis and drawings
- Results of coordination and inquiries with other Federal, State, and local agencies; utility companies; and water districts
- Previous studies and authorizing legislation requirements that will impact design
- Laboratory testing of materials

From Reclamation Manual - Policy - FAC P03, *Performing Design and Construction Activities*, “The responsible official for the program is also responsible for the design data collection activities. The responsible official may obtain the services of another Reclamation office to perform this work.”

Typically, the design office initiates the process by submitting the design data request to the responsible official (originating office). The design team will review the design data collection guideline list(s) for applicable items for their project. For projects with multiple features (i.e., may include a dam, pumping plant, and canal), the design team should consolidate the design data collection guidelines to eliminate redundancy and confusion and to facilitate the prompt and efficient collection of data.

The design office, the originating office, and offices responsible for collecting the design data then agree on:

1. The required content and degree of detail of the design data that is appropriate for the project complexity and design stage.
2. Offices or personnel who are responsible for each design data item requirement
3. Schedule for providing design data to the originating office and the design team

Design data should be submitted in the format requested and agreed upon (material samples, hard copy, electronic file, all three).

2. **Schedule for Collecting Design Data.** It is common to prioritize and stage (schedule) the collection and submittal of design data because not all items are required in order to start design work. The design data collection submittal schedule for *specifications design* is covered in the *Final Design Process Guidelines*: “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 (30-percent review). 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.” (PMT refers to the Project Management Team, and PL refers to the Project Leader.) Concept milestone occurs at the 30 percent complete review.

Design data acquisition for feasibility and appraisal designs may be organized and submitted in a similar manner as for the specifications design.

3. Scope of Design Data Request. The design data that may be required for an appraisal design are presented in Chapter 2, “Appraisal Investigations.”

The specific design data required for feasibility and specifications designs may typically include the following:

- A description of the purpose and goals of the project.
- References to and copies of previous studies as applicable.
- Description of local conditions.
- Description of existing facilities including the future intention of stakeholders.
- Environmental considerations.
- Criteria for design of alternatives that will fulfill project requirements including:
 - Water levels, flow requirements, reservoir storage requirements.
 - Input from outside agencies and stakeholders (design requirements, operation and maintenance requirements, construction requirements).
 - Design standards which have to be met. (i.e., State and local codes for designs of bridges).
 - Review requirements (intermediate and final design products) by Reclamation offices and outside agencies.
- Photographs of existing area and facilities, including aerial photographs. Historical photographs may also be required.
- Surveying necessary to locate existing and proposed facilities and to prepare maps and drawings.

- Base drawings/files required to show location, design, and layout of facilities such as:
 - General map including key map.
 - Location maps.
 - Topographic maps or strip topography for specific sites depending on the project features.
 - Plan and profile drawings along canals, pipelines, and roads.
 - Site plans.
- Existing right-of-way and requirements for additional right-of-way.
- Availability of materials for construction such as precast concrete products and materials from borrow areas (impervious, sand and gravel, and riprap).
- Water for dust control.
- Data for design study/analysis requirements such as: hydrologic studies, geologic investigations, seismic studies, operating studies, water quality studies, water demand studies, traffic counts, etc.
- Construction considerations such as: site access, time limits for construction, flow bypass channel requirements, how construction will be staged, number and type and schedule for potential contracts, and coordination with other construction projects or district operations.
- Operation and maintenance requirements.
- Availability of utilities: potable water, electricity, sewage.
- Site security requirements.
- Data to allow a suitable cost estimate including:
 - Allowance for procurement strategy if other than by open competition bids.
 - State and local (tribal) taxes.
 - Method of projecting costs into the future (if required).
 - Power rates, interest rates, and plant factor for economic studies for pumping plants and powerplants.
 - Location and cost of local materials (precast concrete, etc.).

- Quantities for items which cannot readily be determined in a design office, such as earthwork quantities for canals, removal of vegetation, and existing facilities.
- Borrow and/or waste sites for earthwork.
- Miscellaneous items such as: corrosion potential, public and worker safety, recreation requirements, construction of small buildings (control centers, equipment storage, etc.), removal of vegetation, revegetation, and existing facilities.

The specifications design data collection guidelines (chapter 4) are generally more extensive and detailed than the feasibility study design data collection guidelines (chapter 3). The feasibility design team should review the specifications design data collection guidelines for inclusion of potential additional requirements in the feasibility design data request.

4. Miscellaneous Design Data Collection Considerations

- When the design data collection includes a request for a specific preliminary feature arrangement or layout or recommendation for types and configuration of equipment, etc., the design data should include background for the recommendation.
- When a project involves using an existing facility, replacing an existing facility, modifying an existing facility, or working in the area of an existing facility, the design data should include pertinent data concerning the existing facility such as:
 - Latest drawings
 - Condition of facilities
 - Anticipated future use of facilities
 - Structural capacity
 - Flow capacity
 - Hazardous materials which will require removal and disposal
 - Operation and maintenance
 - Problems with operation of existing facilities
 - Limitations of facilities, equipment, or workforce