

**Forest Service Handbook
National Headquarters – Washington Office
Washington, DC**

**Forest Service Handbook 7509.11 – Dams Management Handbook
Chapter 10 - Records and Files**

Amendment:7509.11-1993-1

Effective date: August 5, 1993

Duration: This amendment is effective until superseded or removed.

Superseded Directive: 1, August 8, 1990; Entire Handbook issued, December 1986

Approved by: F. Dale Robertson, Chief

Date approved:

Responsible Staff:

Explanation of changes: Following is an explanation of the changes throughout the directive by section.

Posting Instructions: Amendments are numbered consecutively by Handbook number and calendar year. Post document in numerical order of chapters (1109.12, sec. 4.32, ex. 01). Remove entire national text of the Handbook and replace with this amendment. DO NOT REMOVE SUPPLEMENTS OR INTERIM DIRECTIVES. Retain this transmittal as the first page of this document.

Revises and updates entire Handbook. Significant changes in direction are as follows:

05: Moves select definitions from FSM 7500. Modifies definitions to agree with Glossary of Terms for Dam Safety, prepared by the Interagency Committee for Dam Safety (ICODS), and Federal Emergency Management Agency (FEMA).

08: Updates reference list and adds names and addresses of agencies, associations, and groups publishing reference materials related to dams and dam safety.

10: Changes chapter title from Project Files to Records and Files.

40: Changes chapter title from Safety Evaluation/Hazard Potential to Safety Inspections and Hazard Assessments. Replaces the term "safety evaluation" with "safety inspection" throughout.

42: Replaces the term "Hazard - Potential Evaluations "with" Hazard Assessment."

42.3: Adds hazard classification examples.

53: Adds direction on location of copies of emergency action plans.

54: Adds direction on testing emergency action plans.

62: Revises direction to exclude Regional dam or water resources engineer from serving on a dam failure investigation team in cases of potential or apparent conflict of interest.

70: Changes title from Dam Inventory to Management of Special Use and Other Non-Forest Service Projects. Previous direction contained in this chapter is moved to FSM 7514; moves direction from previous chapter 80 to chapter 70.

80: Changes title from Management of Special-Use and Other Non-Forest Service Projects to Planning and Design.

Completes previously reserved FSM 7520 and incorporates it into FSH 7509.11.

81: Provides guidance and definitions for four phases in the design schedule.

82: Provides guidance for planning and designing channel layout.

83: Provides guidance for assigning hazard classification.

This Handbook is now available electronically in the National Information Center in the same format as the paper copy. Henceforth, amendments to this Handbook will be issued to Forest Service units electronically on a document basis.

FSH 7509.11 - DAMS MANAGEMENT HANDBOOK
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CHAPTER 10 - RECORDS AND FILES

The inspection program for a dam requires a continuing record of its condition. Pertinent historical data concerning site development, materials, design, construction, and the subsequent behavior of the dam contribute to the overall knowledge of the structure. Thus, a variety of data drawn from various sources over time gradually develops into a project file. The systematic collection and maintenance of these data are essential for conducting efficient inspections as part of the dams management program.

10.2 - Objective. To systematically collect and maintain data essential for conducting the dam safety inspections and maintaining safe dams.

11 - RECORDKEEPING. Prepare and maintain dam inventory and project files for all Class A, B, C, and high-hazard Class D Forest Service-owned or permitted structures (FSM 7515). The primary responsibility for preparation and maintenance of a project file for a dam not owned by the Forest Service rests with the dam owner and should be included as a requirement of the special-use permit or other documents authorizing the project.

11.1 - Required Data. Maintain a complete project file to ensure that future repair or modification of a dam can be carried out in a timely and cost-effective manner. Include the assumptions and criteria used as a basis for design of the structure.

The project file should also contain construction records documenting changes made in the design during construction. Include descriptions of foundation materials and site conditions encountered during construction. Keep maintenance, inspection, and performance records current so that identified problems can be corrected during repair or modification efforts.

Use project files to help conduct an adequate safety inspection and evaluation. Design assumptions, construction records, and maintenance inspection reports provide a basis for determining whether the structure has performed as predicted by the designer or whether unsatisfactory conditions have developed. The data in the files may preclude the need for exploration, testing, and analytical studies that might otherwise be required during future safety reevaluations.

A project file established at a Supervisor's Office or Regional Office for a Forest Service-owned dam must be maintained at that site in accordance with FSH 6209.11, Records Management Handbook. Where there are shared responsibilities, it may be convenient to keep a duplicate file or partial file at the workplace of those who have maintenance responsibility for the structure, such as at an engineering zone office or district ranger's office.

12 - ARRANGEMENT AND UPDATING OF PROJECT FILES. Compile project files in systematic formats in order to facilitate use of the files and accommodate future additions. Microfiche files may be used in lieu of paper files.

12.1 - File Components. The project files should include the following:

1. An index.
2. A copy of the dam inventory printout or a data sheet listing the same information.
3. Specific reports on subjects such as design, geology, hazard evaluation, construction specifications, construction materials testing, design notes, and computations.
4. As-built drawings and maps, construction control records, and contract modifications.
5. Inspection reports, memorandums, and correspondence generated during the design and construction period, arranged chronologically.
6. Instrumentation performance records and analyses.
7. Operation and maintenance plan.

12.2 - Updating Project Files. Preserve the value of the project file through regular review and updating. Examples of information to be included are reports on field examinations, repairs, modifications, observed seepage and movement patterns, large floods and earthquakes, photographs, instrument observations, and analyses reflecting current dam engineering practices.

12.3 - Sources of Information. The following is desirable information to have in the project file and possible sources of information when updating an existing file. The listing is divided into groups of data, beginning with the preconstruction phase, that may have been generated during specific periods of the structure's life.

1. Site and Materials Investigation Data. Site and materials investigation data include the following:

- a. Regional and site seismicity.
- b. Surface and subsurface geologic characteristics and structure.
- c. Exploration techniques used.
- d. Sources of construction materials and engineering characteristics.

- e. Sampling and testing techniques used for foundation and construction materials.

Sources of these data include:

- a. Regional and site geologic reports.
- b. Logs of drill holes, test pits, and exploratory trenches.
- c. Geophysical exploration reports.
- d. Site seismicity reports.
- e. Materials exploration reports.
- f. Materials testing reports.

2. Design Data. Design data include the following:

- a. Soils and materials properties and loadings (static and dynamic) assumed for design.
- b. Analytical techniques and assumptions employed in foundation, embankment, and structural design.
- c. Imposed and estimated stress and stability criteria.
- d. Hydrologic characteristics of the drainage basin and rainfall and runoff records.
- e. Analytical techniques and assumptions used in estimating the flood flows to establish spillway capacity.
- f. Analytical techniques and assumptions used for hydraulic design of the spillway and outlet works.
- g. Operational characteristics and reliability of mechanical and electrical equipment for spillway and outlet release facilities.
- h. Classification of hazard potential.
- i. Reservoir area and volume.
- j. Acceleration limits and analytical techniques and assumptions used for seismic design.

Sources for these data include:

- a. Design reports and calculations.
- b. Technical record of design.
- c. Field and laboratory materials testing reports.
- d. Stress model reports.
- e. Hydraulic model reports.
- f. Flood hydrology reports.
- g. Precipitation and runoff compilations.
- h. Contract plans and specifications.
- i. Dam breach flood routing analysis.
- j. Reservoir capacity and surface area curves.
- k. Seismic response analyses.

3. Construction Data. Construction data include the following:

- a. Construction procedures and methods.
- b. Quality control tests and results.
- c. Characteristics of foundation and construction treatment of the foundation surface.
- d. Subsurface treatment of foundation (for example, grouting and drainage).
- e. Unexpected foundation material and related design changes.
- f. Final foundation configurations.
- g. Extraordinary events that occurred during construction, such as flooding of the work area, embankment and foundation problems, removal of substandard work, and contract disputes that might have produced latent defects that could affect the later behavior of the dam.

Sources of these data include:

- a. Construction specifications.
- b. Inspector's daily diaries.
- c. State inspection reports.
- d. Periodic construction progress reports.
- e. Quality control testing reports.
- f. Foundation grouting reports.
- g. Final construction and geologic reports.
- h. Correspondence among designers, contractor, and resident construction engineer, including work orders and change orders.
- i. As-constructed drawings. Final drawings showing the "as-constructed" condition.
- j. Construction photographs, especially of foundations.
- k. Instrument installation reports and records of measurements during the construction period.

4. Operation Performance Data. Operation performance data include the following:

- a. Recorded floods after construction.
- b. Effects of earthquakes.
- c. Hydraulic performance of the spillway and outlet.
- d. Structural and water-retention behavior of the dam and foundation.
- e. Chronological reservoir stages and related spillway and outlet discharges.
- f. Repairs, alterations, or modifications, and the reasons for them.
- g. Descriptions of materials performance and deterioration which could effect safety and performance of the dam.
- h. Layout and performance capabilities of surveillance instrumentation used to monitor the dam.

- i. Access routes to the dam and access to spillway and outlet control facilities.
- j. Operating procedures and performance records for mechanical and electrical installations.

Sources of these data include:

- a. Operation and maintenance inspection reports, especially comparative photographs, and instrument readings.
- b. Reports of special inspections following floods, earthquakes, or other unusual events.
- c. Instrumentation layouts and drawings, charts, graphs, and plots of chronological measurement and related reservoir stages.
- d. Design operating criteria.
- e. Standard operating procedures and manuals.
- f. Reports of materials testing, destructive and nondestructive, performed to investigate materials deterioration.
- g. Maps showing locations and access routes.
- h. Reports on specific earthquakes from the U.S. Department of Interior, Geologic Survey, Office of Earthquake Studies, and the National Geophysical and Solar-Terrestrial Data Center.