

Appendix D-2: Preliminary Design Deliverables

Project Deliverables	Project Type			
	Conceptual Design	Preliminary Design	Final Design	Construction Project ¹
Conceptual Design Report and Drawings	✓	Application	Application	Application
Preliminary Design Report and Drawings		✓	✓	✓
Landownership Certification Form	✓	✓	✓	✓
Permit Applications		Optional	Optional	✓
Design Review Comments		Optional	✓	✓
Final Design Report and Drawings			✓	✓
Technical Specifications			✓	✓
Construction Quantities and Costs	3		✓	✓
Bidding Documents			✓	✓
Permits		Optional	Optional	✓
Cultural Resources Compliance	2	2	2	✓
Control and Tenure Documents				✓
As-Built				✓

¹Design-build construction projects have an abbreviated set of design requirements before construction. See Appendix D-4.

²Cultural resources compliance may be required if sponsor is conducting ground-disturbing activities during the design phases.

³Rough cost estimate of the preferred alternative.

Conceptual Design

The conceptual design phase of the project describes the initial phase of identifying a restoration project. For preliminary design projects, the application requirements in the project proposal comprise an adequate conceptual design.

Preliminary Design

RCO uses the term “preliminary project design” to define the final deliverable in a preliminary design project, or an intermediate deliverable in a final design or restoration project. Preliminary designs intend to advance project concepts to a detailed understanding and quantification of all the major project elements.

Preliminary designs may traditionally be labeled “30 percent design,” “50 percent design,” etc., but these numeric labels tend to confuse the process and do not always reflect the design detail of the project. For example, preliminary designs for some straightforward projects, such as culvert replacement on a private driveway, may be considered 80 percent of the final design requirements. Conversely, the preliminary designs for some large-scale, complex projects, such as levee setbacks with tidegate installations, may be considered only 20 percent of the final design requirements. Therefore, sponsors and consulting engineers should use the RCO definitions for consistency.

A licensed professional engineer must supervise the preparation of the preliminary design unless the project design is straightforward and sponsor liability concerns are minimal. In that case, a licensed professional engineer may not be required and individuals with applicable experience and technical knowledge may complete the design.

While the detailed scope of each project’s preliminary design process is unique, in general, the process for developing a preliminary design includes preparing surveyed site plans; conducting field investigations of hydrologic, geotechnical, and other site conditions; conducting data analysis; preparing drawings and designs; preparing the design report; and preparing engineering cost estimates. For additional detailed guidance on designing and implementing restoration projects, please refer to Chapters 4 and 5 of the [Stream Habitat Restoration Guidelines](#).

Preliminary Design Deliverables

Preliminary designs must adequately describe all proposed project elements in sufficient detail for permit review and authorization. While the design team may tailor the design process to suit the unique circumstances of each project, the following project deliverables are required for preliminary design projects:

- Preliminary design report, drawings, and engineering cost estimate
- Landownership Certification Form ([Appendix E](#)), if not already provided
- Design review comments (optional)
- Permit applications (optional)

Sponsors must submit these deliverables to the RCO grants manager at the close of the preliminary design project or before moving on to the next phase of the project. The following section provides more details on the preliminary design deliverables.

A. Preliminary Design Report, Drawings, and Construction Cost Estimate

A design report is a record of the technical decisions that inform the development of the selected project design at the preliminary and/or the final design stage. By clearly documenting and explaining the design process, the report allows reviewers and other stakeholders to understand the proposed project and the relevant factors that contributed to its design. The preliminary design report must describe all elements of the project and provide sufficient details to support project permitting.

While the design team may structure the design report to suit the circumstances of its project, in general, the design reports should include the following elements:

- **Introduction:** An explanation of the purpose of the project and its specific habitat restoration goals and objectives.
- **Existing Conditions:** A characterization and analysis of the existing conditions relevant to project design. These conditions include: Description of the problem; summary of site, reach, and watershed conditions; biological and water quality factors as they relate to the project conditions; site history and constraints leading to the observed problems and which may present challenges to restoration; and description of identified causes of the problem. This section typically includes historical data; surrounding land uses; landowner and community expectations; survey information (topographic, geomorphic, and vegetative); sediment sampling; water velocities, depths, and flow rates; groundwater or hyporheic flow evaluation ranges; tidal elevation and ranges; and maintenance requirements. The level and detail of survey and data collection needed depends upon project goals, objectives, and the context of the project.
- **Preliminary Design Alternatives:** An identification, description, and evaluation of design alternatives considered to achieve the project goals and objectives. Describe each element of the design alternatives. Include a comparison of each of the alternatives discussing project objectives, other evaluation criteria (such as fish benefit, maintenance, sustainability, social acceptance, etc.) and cost, to the extent that cost data is available at this stage of the design process.
- **Preferred Alternative:** A description of a preferred alternative and the rationale for choosing it, citing the relevant factors described above. Include a brief explanation of why other alternatives were not selected.

- **Design Considerations and Preliminary Analyses:** A listing of specific design criteria that define the intent and expectations for each project element. Design criteria are specific, measurable attributes of project features that clarify the purpose of each project element and articulate how each element will contribute to the project's overall goals and objectives. Include justification and documentation of design methods applied, including assumptions that facilitated the design. Provide design output, including analytical results of all technical and design analyses and how these translate to project element designs.
- **Permitting and Stakeholder Consultation:** A description of regulatory and/or other public consultation activities. Review and address comments from agencies and other stakeholders in the preliminary design. This section is optional based on proposed deliverables in the application.
- **Preliminary Design Drawings:** The preparation of preliminary design drawings is key to completing a successful habitat restoration project. All design and restoration projects require preliminary design drawings. Provide preliminary design drawings in digital format (e.g. AutoCAD). Each drawing should be to scale, and it is strongly suggested that the vertical and horizontal scales on the drawings be kept the same.

For the preferred alternative, minimum drawing requirements include depiction of all elements of the project in sufficient detail to support project permitting and include at a minimum the following:

- Existing site plan showing: Area/location map; property boundaries; landownership; road, utilities, or other infrastructure as appropriate; scale; north arrow; water bodies and direction of flow; and bank-full width or mean low and high water (marine waters).
- Project site plan view drawing(s) showing proposed actions overlaid on the existing site plan (above). The site plan should include all project elements including installation and removal of fill, wood, rock, culverts, infrastructure, clearing and staging, dewatering, etc.
- Project profile and cross-section at important project locations showing water surface elevations relevant to the design (e.g. ordinary high water, maximum design flow, tidal elevations, flood elevations, etc.)
- Structure design details, as needed.

Provide additional design drawings for complex projects and projects with multiple features or multiple sites.

- **Construction Quantities and Preliminary Construction Cost Estimate.**

- **Appendices:** Include references, analytical and model inputs, outputs, and other supporting documentation.

B. Design Review Comments (Optional at Preliminary Design Phase)

Send the preliminary design report and drawings to relevant stakeholders and the RCO grants manager after the in-house review. After a reasonable time for review, plan an on-site visit to review the design plans at the project location with stakeholders (e.g. landowners, co-managers, lead entity citizen and technical groups, the RCO grants manager, etc.).

These steps have been very useful for a comprehensive “reality check” for stakeholder review and consideration of all stated project objectives.

Send the RCO grants manager a memo (or similar correspondence) that consolidates stakeholder comments and other considerations received during design review. The memo should describe how the comments have (or have not) been incorporated into the design. Distribute this memo to all entities involved in the review. This step is optional because, for some sponsors, this step is more practical during the final design phase.

C. Permit Applications (Optional at Preliminary Design Phase)

The sponsor should provide permit applications or proof of permit receipt (e.g. copies of permits or permit numbers and issue dates) to the RCO grants manager or in the PRISM progress report under the “Permit” tab. This step is optional at the preliminary design phase because, for some sponsors, this step is more practical during the final design phase.