Draft Scope of Work for
Final Pre-Design Study of Alternatives for the
Rehabilitation and/or Replacement of Lake Conestee Dam
(SCDHEC Dam No. D-2876)

Study Objectives:

The purpose of the proposed study is to provide a **rigorous, independent and objective assessment of all viable engineering alternatives for the rehabilitation and/or replacement of the present Lake Conestee Dam**. The work product of this assessment will identify the Recommended Alternative to optimally address all dam design and performance criteria.

Previous studies of the present dam, constructed in 1892, as well as multiple SCDHEC inspections, have found the existing structure to have numerous deficiencies and vulnerabilities attributable to the dam's advanced age, deterioration, and the nature and extent of contaminated sediment contained by the dam in the upstream reservoir of old Lake Conestee. Previous dam failure episodes have been repaired but resulted in the releases of large quantities of contaminated sediments to the Reedy River downstream. This dam is presently classified by SCDHEC as a Significant Hazard structure. In its 01 December 2016 inspection of the dam, SCDHEC's Upstate EQC Office engineers summarized the dam as in "Poor" condition.

The proposed study will produce a single **Recommended Alternative** for rehabilitation and/or replacement of the dam. This Recommended Alternative will be assessed further to provide detailed (*but not final design level)* definition of concept, design criteria, conceptual drawings showing configuration and location, land requirements, construction costs, long-term maintenance and management costs, special requirements, permitting requirements, and a projection of schedule and duration of all construction activities to include pre-construction testing and site preparation, and post-construction site restoration.

Process 1: Site Inspection, Measurements, Survey, and Testing

The engineering firm will inspect the existing dam, upstream and downstream site conditions, accessibility, and other relevant features. To the extent necessary, supplemental site, geotechnical, and structural testing may be performed, to include limited non-destructive probing of the upstream profile of the existing dam. Other physical testing procedures specific to the Recommended Alternative may be performed during the detailed design process *(not a part of the present study scope).* In addition to site inspection activities, the engineer will compile all relevant historic data informative to the review of alternatives and support the identification and specification of a Recommended Alternative.

Process 2: Identification, Review, and Screening of Alternatives

1) Review of all alternatives assessed in CFI's "Final Report: Feasibility Study of Alternatives for Rehabilitation of Lake Conestee Dam", Oct 2012. The alternatives shall include no action, complete dam removal, partial dam removal, rehabilitation of the existing structure, upstream replacement dam options, and downstream replacement dam options.

2) Identification and evaluation of any additional new or innovative alternatives that may be viable, or modifications to those identified in the Oct 2012 Feasibility Study Report.

3) All alternatives reviewed must be analyzed and screened against the following performance criteria.

   - All alternatives, including any modification to the existing dam, or any configuration of a replacement dam must effectively prevent substantial release of contaminants, and contaminated sediment associated with the regulated site, Lake Conestee. This criterion shall include migration of contaminants through the structure. *(This requirement is as specified in the Restrictive Covenant signed by CFI and SCDHEC, Nov 2007, which governs the long-term care of Lake Conestee).* This requirement means that to satisfy this criterion, the alternative must function effectively, throughout its design life as a contaminated sediment (waste) containment structure.
   - Any modification to the existing dam, or any replacement dam, must, at a minimum, provide the same level and capacity of hydrologic function as the present dam and its present classification as a Significant Hazard structure.
   - In addition, each alternative must also be reviewed to determine if it can perform to the design standards for a High Hazard structure, which may include primary spillway capacity to pass one-half of the Probable Maximum Flood, or a higher design storm, as specified by SCDHEC requirements or other customary design requirements.
   - Design life. All alternatives should be assessed in the context of a one-hundred year design life. This assessment should consider the potential of each alternative to perform for this design life, to be serviceable, and protective of the environment, downstream properties, and public safety.
   - Construction cost estimates shall be developed for each alternative sufficient to understand the relative magnitude of each. The cost analysis should take into consideration the special requirements of each alternative, such as temporary coffer dams, removal and disposal of contaminated sediment, control measures necessary to prevent substantial releases of contaminated sediment, and control measures necessary to protect the construction site and downstream assets in the case of a significant flood event during construction. Each alternative should also be assessed in terms of costs for land required on the adjacent downstream mill property (not owned by the

Foundation), and impacts and restrictions to the future use of the downstream mill property.

- Long-Term Costs. Each alternative should be evaluated with respect to long-term costs for routine inspections, large woody debris management, regulatory compliance and reporting, emergency action planning, routine and non-routine repairs, and safety and security. Long-term costs should be assessed for each alternative sufficient to understand the relative magnitude costs for each. These costs should be examined in the context of the intended minimum design service life of the structure of 100 years.
- Constructability. Each alternative evaluated should be examined in light of the special requirements necessary for safe, expedient, and environmentally protective construction activities.

Process 3: Selection and Detailed Analysis of a Recommended Alternative

Selection of a Recommended Alternative that takes into consideration all of the above criteria as well as other appropriate dam design and dam risk management standards. A framework for comparison of alternatives and tables summarizing the strengths, weaknesses, fatal flaws and special requirements of each alternative should be provided to justify the selection of the Recommended Alternative.

Process 4: Detailed Pre-Design Analysis for the Recommended Alternative

1) For the Recommended Alternative identified as the final and optimal solution, this option must be analyzed under two spillway design scenarios.

   a) The Recommended Alternative must be assessed under the assumption that it must have hydrologic performance characteristics consistent with those of the present structure, which is classified as a Significant Hazard dam.
   b) In parallel, the Recommended Alternative must also be assessed under the scenario that it must serve as a High Hazard structure, due to potential placement of residential units or other uses of historic mill buildings located downstream of the dam, which may result in potential for loss of life in the case of a dam failure. This assessment should evaluate the dam subject to design standards for a High Hazard structure. This includes design of the primary spillway and other dam features capable of passing ½ of the Probable Maximum Flood, or a larger design storm, or other standard consistent with regulatory requirements and customary practice for such a structure.

2) Final pre-design concept drawings and specifications sufficient to characterize the plan, profiles, and perspective views of the Recommended Alternative.

DRAFT

These drawings should be developed for both Significant Hazard and High Hazard scenarios, as described above. To the extent possible, the design objectives should assume the elevation of the present primary spillway *(approximately 797 ft MSL)* should be the design spillway elevation for ordinary run-of-river flows of any new structure, so as to prevent significant change in the design elevation for the ambient impoundment pool, flooding of areas around the impoundment, and to minimize change in the areas of contaminated sediment subject to disturbance and flooding.

3) To the extent practicable in this "Final Pre-Design" assessment, this process should also specify the design criteria for the Recommended Alternative. These criteria would provide a starting point for the following detailed design process *(not a part of the present study scope),* but would be subject to modification during design as supplemental design data becomes available.

4) Land Area Requirements. The area needed for the Recommended Alternative selected should show the following. Any areas not presently owned by the Conestee Foundation, e.g. portions of the Conestee Mill parcel, should be identified by extent and area. These requirements should be identified for both the Significant and the High Hazard classification scenarios.

   - The area of any footprint of the dam and appurtenant structures other than that of the existing dam, or in addition to the existing dam, required for the Recommended Alternative.
   - Areas where site preparation would be required, to include removal, interim staging and containment, and handling of potentially contaminated residual soils, sediments and other environmental media.
   - Additional area beyond the constructed footprint, required for construction access, staging, lay-down areas, and security during construction.
   - Area required for long-term routine inspections, maintenance activities, periodic removal of woody debris, protection of public safety, safety setbacks, and protection of dam security to include considerations of FEMA, DHS, U.S. Army Corps of Engineers, SCDHEC and other agency requirements.
   - Approximate location of security fences and signage appropriate to protect the public and the dam.

5) Development of detailed best practicable cost estimates for implementation of the Recommended Alternative. Cost elements should include detailed design, land acquisition, permitting and related studies, site preparation (to include management of residual contamination, demolition, and grading), environmental protection measures, special testing, construction (all elements), post-construction cleanup and security, construction management and oversight, project management, and any other appropriate cost breakdown elements.

6) A special "additional item" should be estimated to construct a façade for the downstream faces of the structure, if other than the present historic structure,

DRAFT

that presents as a "historic stone-masonry" façade that respects the appearance of the historic 1892 structure. The cost for this additional item should be identified as a separate and optional item.

7) A parallel estimate should be made for all anticipated long-term requirements for operations and maintenance activities, inspections, permitting, routine reporting, special event monitoring (e.g. defined seismic or hydrologic event), routine updates to Emergency Action Plans, any required environmental monitoring activities and related reporting, ongoing site security measures to include human and automated surveillance, routine repairs, special repairs, measures to control large woody debris, and infrequent but necessary special activities to include maintenance of fences, signage, and security measures, and other long-term care elements as needed.

8) The Final Pre-Design Assessment for the Recommended Alternative should project a duration of each phase of construction and post-construction activities. These phases should take into account, at a minimum, the duration required for development of detailed design drawings and specifications, special testing related to construction, special studies required for environmental protection, permitting, project administration to include development of appropriate contracts, insurance and bonding and related measures, bidding and negotiations with qualified contractors, site preparation, construction, and post-construction cleanup and final inspections. Appropriate contingencies should be provided to consider unique site conditions, regulatory requirements, potential weather and flooding conditions that may occur during construction, and other uncertainties that may affect construction, public safety and the environment.

END OF DOCUMENT

DRAFT