

**STATEMENT OF WORK
FOR LABORATORY MODERNIZATION DIVISION'S AND SPALLATION NEUTRON SOURCE'S
ARCHITECT-ENGINEER SERVICES
June 2, 2020**

1.0 INTRODUCTION

UT-Battelle's (UT-B) Laboratory Modernization Division and Spallation Neutron Source (herein, collectively referred to as "LMD") are responsible for the planning, design, project management, and construction management of new facilities, facility modifications, and utility infrastructure projects at Oak Ridge National Laboratory (ORNL). The LMD provides these services using both UT-B engineering personnel and subcontracted services provided through Architect-Engineering (A-E) firms. This statement of work provides a description of the required A-E general technical services and capabilities to augment LMD's staff and services.

2.0 SCOPE OF WORK FOR GENERAL SERVICES

The scope of work includes the technical services (personnel, support resources, and tools) and engineering and design services necessary to support LMD in conceptual planning, programming, design, and construction for facility construction and renovation; utility infrastructure development and renovation including conceptual and master planning and general programming support; Homeland security projects; general design engineering, start-up testing, operational commissioning and support for ongoing infrastructure projects; and other miscellaneous studies and technical activities necessary to successfully accomplish future projects. The A-E shall have qualified staff or access to staff in architectural and engineering disciplines to support the typical projects described in the following sections. The AE shall have established policies, systems, procedures, and tools in place to ensure the quality of the services and deliverables provided. Details of the services to be provided are included in the following sections.

a. Pre-design Services

The objective of this work element is to define project needs, under the technical direction of LMD, and to support ORNL program requirements. The major deliverables in this phase are system requirements documents (SRD), conceptual design reports, feasibility study reports, preliminary proposals, evaluation of project alternatives, economic analysis, and cost estimates for conventional facilities as well as large campus infrastructure projects such as central chilled water loops (up to 100MW), sewage collection and treatment, potable water storage and distribution, storm water collection and environmental mitigations, steam distribution and generation, communications and fiber networks, high density data processing facilities, cryogenic systems for super cooling, vacuum systems, and 13.8KV power distribution systems.

The potential key activities involved in accomplishing the objective of these work elements are as follows:

1. Perform conceptual design and engineering feasibility studies including making calculations, computer analyses, and generating feasibility reports
2. Assist LMD Project Manager (PM) in developing project execution plans
3. Develop project functional/operational system requirements documents
4. Generate programming documents and design criteria documents, including room data sheets

5. Study alternatives with conceptual level cost estimates to support budgetary development efforts
6. Perform appropriate technical reviews/analysis
7. Generate preliminary cost estimates and economic analysis of alternatives (LCC analysis and PW analysis)
8. Generate Conceptual Design Reports including the technical information documentation, outline specifications, and supporting electronic sketches in Bentley Microstation format
9. Develop safety documentation
10. Develop risk assessments and contingency analysis
11. Develop Safety Fire & Hazardous analysis, and Reliability Analysis

b. Design Services

The objective of this work element is to provide for the detailed design of sustainable ("green") engineered systems and generate contract document packages for engineering and architectural design services. All work will be performed under the direction of the LMD technical and project management personnel. Packages will include Professional Engineer or Registered Architect stamped design calculations, drawings, specifications, and other miscellaneous deliverables. Specification format shall adhere to CSI Masterformat 2016. Design packages shall result in constructible projects with performance meeting the attributes stated in the customer SRD. The potential key activities in accomplishing the objectives to this work element are:

1. Develop design criteria documents
2. Review and comment on project functional/operational requirements (systems requirements documentation or program documents)
3. Prepare Preliminary Design (programming, schematic design, design development) and Design Development (contract document preparation) designs for all disciplines (architectural, civil, structural, environmental, electrical, instrument, piping, HVAC, fire protection and process)
4. Provide Construction Support services (bid evaluation and negotiation, construction administration) as required
5. Perform design reviews of other consultants' work
6. Perform constructability reviews
7. Provide computer aided design (CAD) drawings in Bentley Microstation format (Note: Work at SNS facility will require Autocad capability.)
8. Prepare commissioning plans
9. Prepare Energy Efficiency / Sustainability Reports
10. Prepare Life Cycle Cost (LCC) analyses
11. Perform Value Engineering studies using a certified Value Engineer
12. Prepare cost estimates and detailed bill of material drawing take offs
13. Prepare Economic Analysis using PW analysis
14. Provide home office support during construction by reviewing vendor submittals, respond to contractor requests for information, and generating sketches and drawings required to address contractor questions due to changed conditions and/or design omissions/errors
15. Provide sustainable designs utilizing the Guiding Principles for Sustainable Federal Buildings or the US Green Building Council's LEED system. Provide documentation and tracking.
16. Provide packages that result in building information modeling (BIM) and 3-D clash modeling where required by the project work scope.

c. Start-Up and Commissioning

The objectives of this work element are to support initial start up, operational tests, and commissioning (CX) activities on new equipment and facilities. The major deliverables for this effort will be test results, start-up reports, CX reports, and project critiques.

The key activities involved in accomplishing the objective of this work element are as follows:

1. Assist/direct start-up operations
2. Provide operational test support
3. Develop commissioning plans and specifications
4. Perform field surveillance and commissioning activities
5. Provide training to operations personnel
6. Perform project critiques and report Lessons Learned

d. Miscellaneous Support Services

The following miscellaneous architectural and engineering support services may be required under this contract:

1. As-built drawings
2. In field verification of existing building/system configurations
3. Technical advisory assistance
4. Evaluation or consultation on implementation of engineering management processes (architectural, civil, structural, environmental, electrical, instrument, piping, HVAC, fire protection and process)
5. Software systems acquisition, implementation and training

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