

YATES SHAFT REHABILITATION FEASIBILITY STUDY 2020/2021
Request for Proposal
SANFORD UNDERGROUND RESEARCH FACILITY, LEAD SD

General Information

Document Type: Request for Proposal Solicitation Notice

Solicitation Number: 2020-34

Posted Date: October 15, 2020

Original Response Date: December 1, 2020

Current Response Date: December 1, 2020

Contracting Office Address:

Sanford Underground Research Facility
630E Summit St
Lead, SD 57754

Description

1. CONTRACT INFORMATION: Request for Proposal

This contract is for the procurement of Architect-Engineering (A-E) services in accordance with South Dakota Science and Technology Authority (SDSTA) guidelines. An individual firm or firm partnership will be selected for fee negotiation based on demonstrated competence, qualifications and cost/schedule proposal for the required work.

2. PURPOSE/OVERVIEW - Engineering services are required for:

Preparation of a Feasibility Study for the Sanford Underground Research Facility (SURF) Yates Shaft Rehabilitation. Services are to include site meetings/investigations, planning workshop(s), engineering studies, and high-level concept designs to produce cost and schedule estimates that would inform future project budget programming and eventual reconstruction and/or possible reconfiguration of the Yates shaft infrastructure utilizing existing hoisting plant and headframe.

The project involves developing possible cost-effective concepts for the rehabilitation of the existing wood shaft to a steel/concrete-based structure. The investigation must also consider methods of maintaining limited access to operations levels in the shaft during rehabilitation/construction on a site-wide underground access approach.

This announcement is open to businesses that have been approved based upon the Request for Qualifications stage of the project procurement process. This is Stage 2 of the project procurement; Request for Proposal (RFP). A firm-fixed-price contract will be negotiated at the conclusion of the RFP project procurement stage.

BACKGROUND-

The existing Yates shaft facilities were constructed in the 1930's and 40's by the Homestake Mining Company for the purposes of moving personnel to underground gold mining operations and hoisting ore to the surface. In 2007, the Sanford Underground Research Facility (SURF) took over the property and now uses the Yates shaft for transport of personnel and material loads to various underground levels for science and research purposes.

The Yates shaft collar extends from the surface to an approximate depth of 300 feet. The collar is constructed of monolithic concrete with a six-compartment configuration (see Figure 1: Yates shaft compartment cross-section). The existing collar sets are steel (steel dividers in the collar area only), located on 6-ft centers. The dimensions of the existing collar concrete dictate the maximum allowable cross-sectional area for any proposed future conveyances.

The remainder of the Yates shaft from the collar bottom to the 5145-level shaft sump is presently supported by timber sets placed on 6-ft centers. The existing skip compartments and shaft perimeter are tightly lined with 2-inch by 10-inch timber. Most bearing sets are found at each station, which is typically every 150 feet.

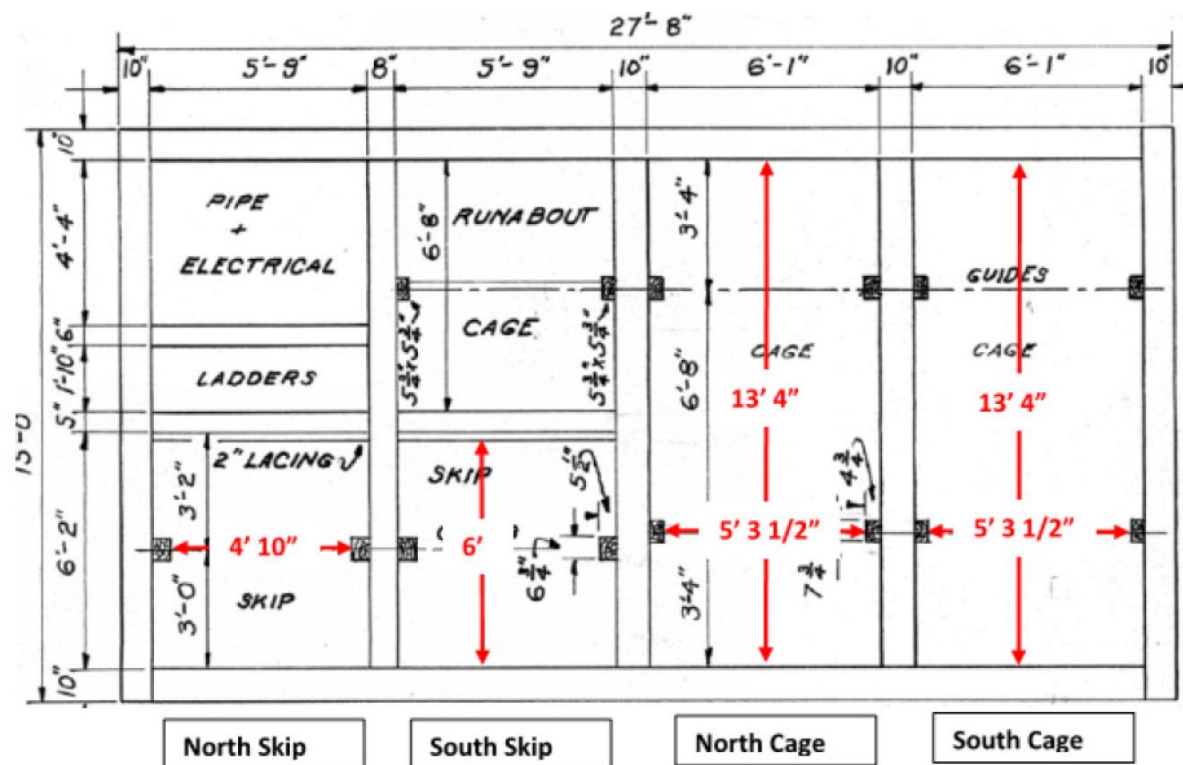


Figure 1: Yates Shaft Plan View – Typical Set Compartment Layout.

SDSTA shaft crews have been performing top-down maintenance activities on the shaft over the past 10 years. They have recently completed shaft scaling, rock bolting ground support, turnbuckle installation, and timber relining in the skip compartments top down to the 4850-level, and in the cage compartments down to the 4430-level (work still progressing in the cage compartments until the 4850-level is reached). The utility and runabout cage compartments, however, have been left essentially untouched. The timber below the 4850-level to the shaft bottom has also remained essentially untouched. (See Figure 2: Yates Shaft Elevation View).

The Yates hoisting plant consists of two Nordberg dual-conical-drum rope hoists (production and service) manufactured in the late 1930's, with the original controls and drives/brakes/clutches of that era. Both hoists currently operate to maintain conveyance nominal conveyance speeds of 500 fpm (much less than the 2000 fpm or more practiced by Homestake Mining Company during the earlier years).

of gold production). It is envisioned that the hoist(s) drives/brakes/clutches will need upgrading to meet future facility requirements/demands. SURF has already budgeted said hoist improvements to be implemented on the Yates service hoist. The Yates production (skip) hoist upgrades are pending this Yates Shaft Rehabilitation Feasibility Study findings/conclusion.

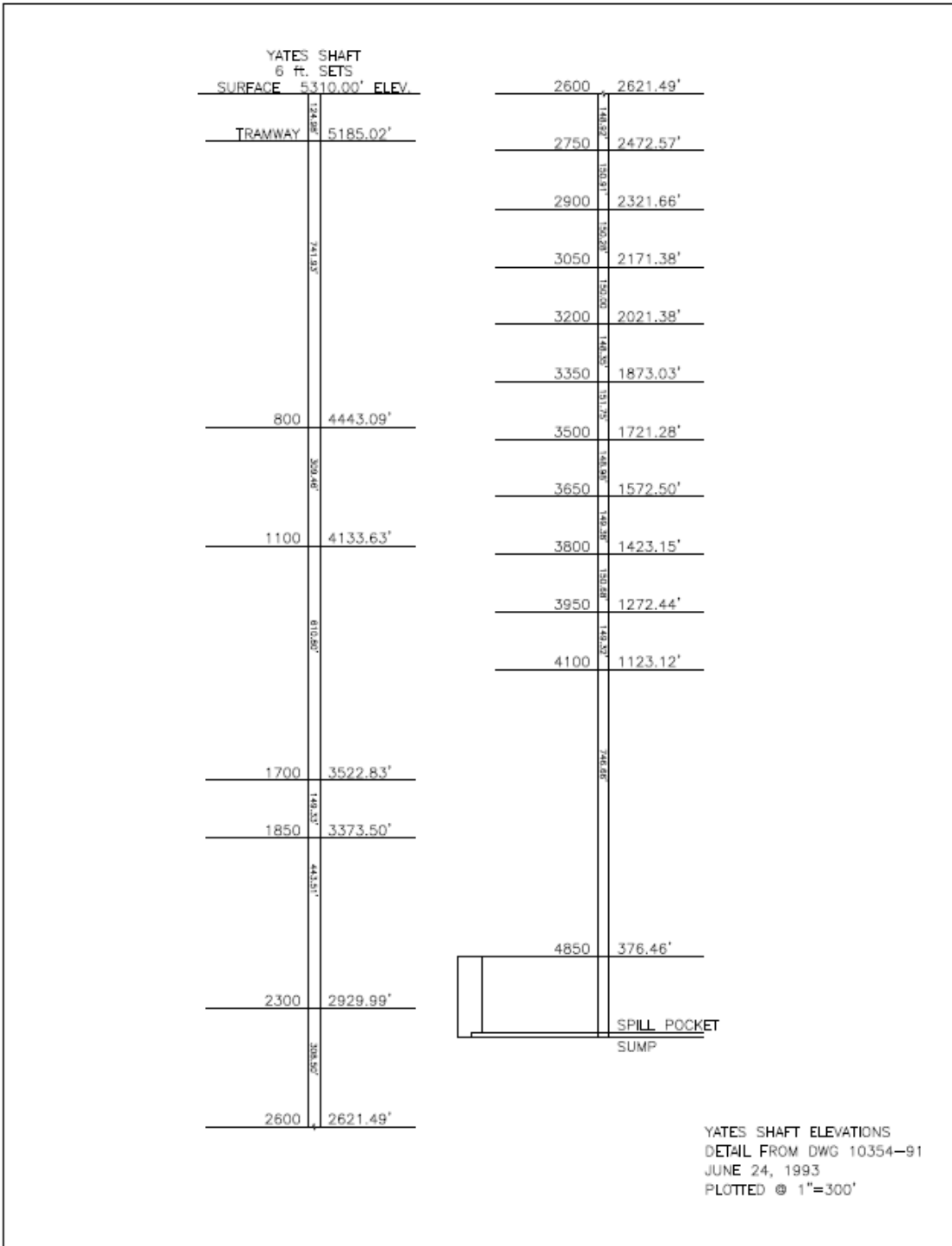


Figure 2: Yates Shaft Elevation and Station Levels.

The facility has a second functioning shaft (Ross shaft) that has gone through a 100% rehabilitated and refurbished with steel sets (on 18-foot centers), along with a new cage and skips (Completion and certification in early 2021). The Ross complex is being outfitted with upgraded crushing and conveying facilities to extract rock from excavations needed to support science (conveying infrastructure completion expected in early 2021 with excavation completion projected for late 2024). The Ross hoisting plant (both the service and production hoists) are being upgraded with modern drives/brakes/clutches, and a slack-rope system was added onto the service hoist/conveyance system.

It is anticipated that future excavations for science on multiple levels will be serviced by the Ross shaft. As such, the Yates skips are no longer needed for rock transport, and may therefore be considered for additional personnel/logistics transport area for the purposes of this study. Figure 3: Ross Shaft Elevation and Station Levels is provided to illustrate the common Ross Shaft and Yates Shaft levels. Understanding of the interaction and accessibility of the facility by both the Ross and Yates shafts is important for the overall site function.

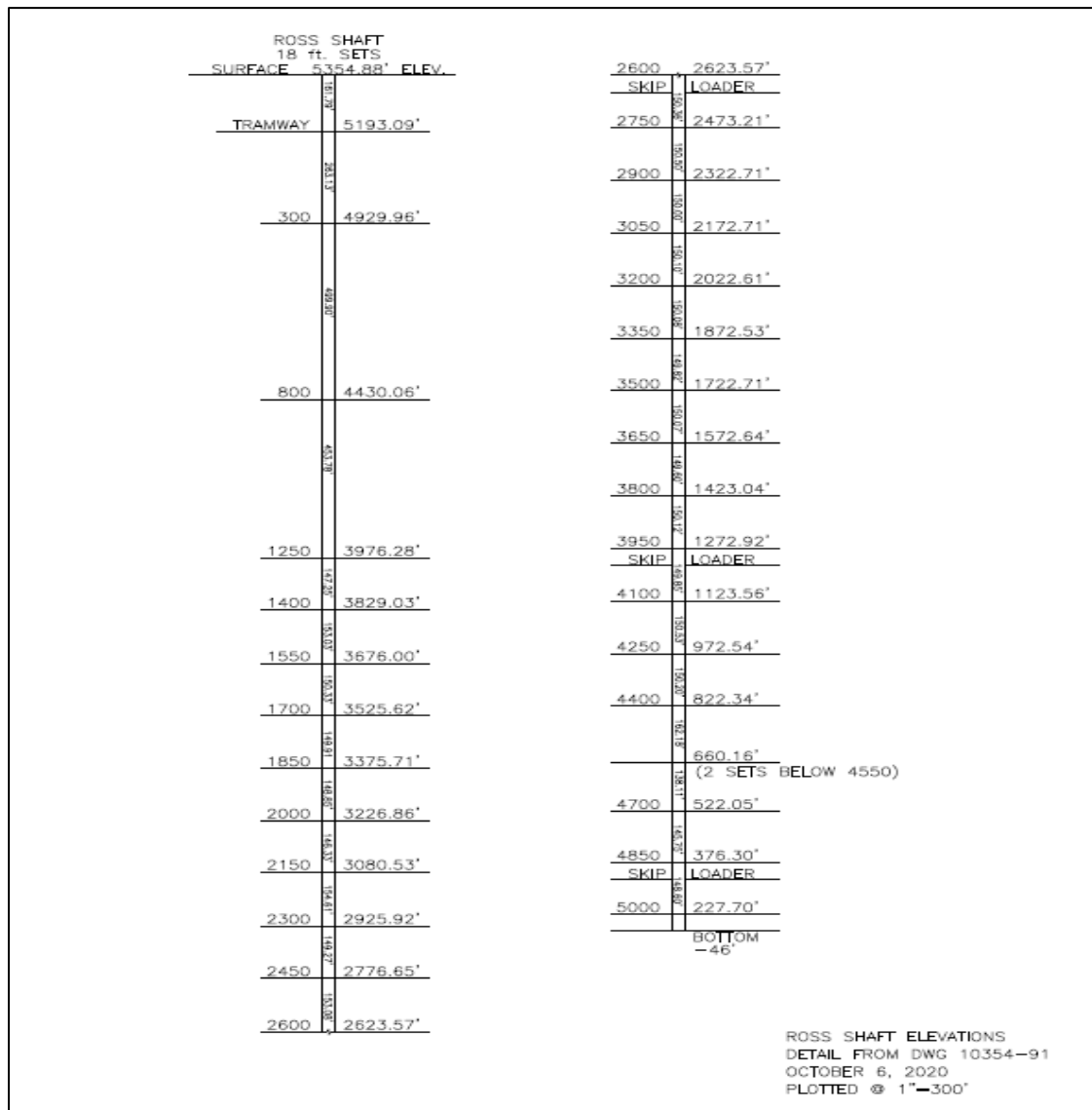


Figure 3: Ross Shaft Elevation and Station Levels.

3. DESCRIPTION OF WORK - Design/consultation services are required for:

Performance of a feasibility study for rehabilitating the Yates shaft while incorporating options to improve/optimize personnel, material transport and accessibility to the various underground levels utilized for science and SURF facility operations. The goal of the shaft rehabilitation project is to replace aging wood sets with steel/concrete structure to reduce risk of shaft failure, reduce facility maintenance costs, improve personnel access timing to various levels, and to improve shaft reliability. Investigation into shaft compartment reconfiguration/reallocation is possible if sufficiently advantageous to facility operation's needs. Maintaining limited access to underground levels during construction is highly desired given the Ross shaft will be largely dedicated to the LBNF/DUNE (Long Baseline Neutrino Facility/Deep Underground Neutrino Experiment) construction for the foreseeable future.

The Final Feasibility Report and supporting documentation will be used to inform facility management and science sponsors with the US Dept of Energy on the cost and schedule for rehabilitating the existing Yates shaft structure, and to subsequently plan/budget/schedule future project detailed design, procurement and construction efforts.

4. REQUIRED SERVICES - Feasibility Study Deliverables:

1. Shaft Configuration/Compartment Use Options – discuss feasibility of varying shaft configuration options and the resultant impacts on underground personnel/material accessibility.
2. Phased Construction Potential – discuss phased construction potential for varying shaft configuration options that may facilitate limited underground access or reduce impacts to underground access.
3. Cost and Schedule – provide construction cost and schedule estimates for varied shaft configuration options.
4. Final Report and Summary Presentation- document and present the Yates Shaft Rehabilitation Feasibility Study findings/conclusions. Summarize pros/cons of each shaft configuration option considered in the study and provide path-forward recommendations.

Means & Methods/ Items to include in Feasibility Study Considerations:

- A. **INITIAL INVESTIGATION/WORKSHOP:** It is anticipated that the successful AE firm would conduct initial site investigations, historical document gathering, and preliminary engineering reviews/interviews at the initiation of the project. Part of this initial investigation effort is to include an AE-led, on-site pre-feasibility workshop conducted with key SDSTA personnel/team members and the AE firm team to download certain historical study and facility information, and to ensure the feasibility study results align with existing SDSTA/SURF goals and vision.
- B. **PROGRESS UPDATE MEETINGS:** Include AE-led bi-weekly video conferencing progress update meetings, with associated published/distributed notes and action item tracking, as part of the proposal. Start this program after completion of the Initial investigation/workshop stage.
- C. **DESIGN REVIEW & MEETING (roughly 30%):** Include an on-site, post-investigation, project review meeting to discuss initial investigation findings/conclusions and to focus/clarify feasibility study options to be included in the feasibility study/estimation.
- D. Identify areas where SDSTA can focus continued/limited maintenance/rehabilitation efforts ahead of a full-scale shaft rehabilitation/construction project. This will help inform where SDSTA might concentrate maintenance efforts in areas where cost, schedule and improved access benefits might be realized ahead of a major construction campaign.
- E. Identify hoist plant, conveyance, and head frame upgrades that would be necessary to support various shaft rehabilitation options.

- F. Include cost/schedule impacts to rehabilitate/install ground control measures at each of the Yates stations (from surface down to the 4850 level) within 25 feet of the shaft as part of the feasibility study.
- G. **DESIGN REVIEW & MEETING (roughly 60%):** Include a project review period and subsequent video conference meeting deliverable to discuss SDSTA review/comments on the investigation findings to date. This provides and means to address possible missing or incomplete information, focus final discussions/conclusions, and to clarify outstanding issues prior to proceeding into the final reporting stage.
- H. **PRE-FINAL REVIEW (roughly 95%):** Include a review/comment allowance deliverable to allow SDSTA to provide feedback on AE draft findings, report, and presentation prior to final publication.
- I. **FINAL REPORT & PRESENTATION:** Include an on-site final project review/presentation of feasibility study findings and conclusions. Discussions to include recommendations of next steps and future plans to support rehabilitation project scoping/budgeting/and project justification to the US Dept of Energy and project stakeholders.

5. SUBMISSION REQUIREMENTS: RFP stage proposal evaluation items

Firms must submit a project-specific, lump sum cost and schedule proposal to the above address not later than 2:00 PM on the response date indicated above.

Specific proposal information required:

- A. Firm (or Branch Office) Name and Address.
- B. A brief description on how the AE firm is going to perform/execute the feasibility study. Include a description of the management approach, coordination of disciplines/subcontractors, quality control procedures, and prior experience with similar projects.
- C. Provide an organizational chart of proposed team.
- D. List of qualified professional personnel in the following key disciplines: Project management (architect or engineer), structural/civil engineering, mining engineering, mechanical engineering, electrical engineering. The lead engineer in each major discipline of the design must be registered to practice in the state of South Dakota (*SD Professional Engineer status*) in the appropriate professional field OR have ability to obtain South Dakota PE registration status should the firm be selected.
- E. Cost to perform the Feasibility Study as described herein. Include estimated manhours per discipline, travel/expenses, and overhead that is assumed by the AE to justify/support the proposed Feasibility Study costs and timeline. Use attached Cost Template – Yates Shaft Rehab Feasibility Study or approved equivalent to present proposal cost breakdown.
- F. Estimated Schedule/Timeline to perform the Yates Shaft Rehabilitation Feasibility Study SOW.

6. FINAL SELECTION AND NEGOTIATION: RFP stage.

SDSTA will evaluate the proposals offered and negotiate final contract terms, schedule and cost with the selected, acceptable firm.

7. POINT OF CONTACT & DUE DATES

Submit one electronic copy of the proposal to mbaumann@sanfordlab.org by 2:00 P.M. MT December 1, 2020. Then SDSTA reserves the right to conduct interviews/clarifications as required.

Please direct all questions in writing to Michele Baumann at mbaumann@sanfordlab.org by close of business **November 4, 2020**. Questions and answers will be posted as an amendment to the RFP by

2:00 P.M. MT November 13, 2020. Likewise, the Proposal shall also provide information of a firm's representative that SDSTA is to contact for obtaining additional information.

8. ADDITIONAL BACKGROUND INFORMATION & PROPOSAL SUPPORT/APPENDIX

The attached high-level documentation (listed below) is provided to explain the existing facility infrastructure layout and facility underground access status to inform an AE firm to respond to this RFP. It is intended for the successful AE firm to obtain more detailed historical information and knowledge on the shaft/facility during the initial investigation/execution phase (post-award) of the contract.

1. SURF Facility Access Specifications. Version 1.0, January 2020. (40 pages)
2. Yates Shaft Stations. (3 dwgs)
3. Yates Shaft Profile. (3 dwgs)
4. Yates Yard, Yates Headframe Profile, Yates Hoist Room Layout Plan. (3 dwgs)
5. Yates & Ross Shaft Elevation View. (1 dwg)
6. AE Cost Template – Yates Shaft Rehab Feasibility Study. (1 page spreadsheet)