

Staff Report

for the Board of Directors' Meeting of March 23, 2016

TO: Board of Directors
FROM: Gary King, Engineering Manager
Adrian Schneider, Senior Associate Engineer
DATE: March 16, 2016
SUBJECT: Chicago Park Powerhouse Switchboard & Relay Upgrade

ENGINEERING

RECOMMENDATION:

Approve a contract with HDR, Inc. (HDR) for \$243,628 to provide consulting services for the Chicago Park Powerhouse Switchboard & Relay Upgrade (Upgrade), and authorize the General Manager to execute the necessary documents.

BACKGROUND:

The District's Hydroelectric Division is using old and outdated electro-mechanical devices in many of its powerhouses. Replacement parts for the devices are no longer available and are kept in use by salvaging parts from spare equipment to maintain the antiquated devices. The District is updating its powerhouses to incorporate modern equipment standards and to provide better levels of protection and reliability in their operation.

HDR was contacted and asked to solicit a proposal to provide services for a complete design and installation oversight for the Upgrade. HDR's proposal includes preliminary engineering, design, bid services support, manufacture's oversight, construction oversight and start-up services in its scope of work.

HDR is recommended by staff as a sole-source for this Upgrade work. HDR successfully upgraded the District's Dutch Flat No. 2 Powerhouse in 2012. HDR would therefore integrate this proposed Upgrade in similar fashion knowing the District's needs and criteria. Their past project experience with the District, thorough proposal, and overall expertise makes them the most qualified choice for the contract. HDR's consulting engineering services for the upgrade is \$243,628.

Upon review of the proposal with the Hydroelectric Manager and Hydro Maintenance Supervisor, staff recommends awarding the contract to HDR.

BUDGETARY IMPACT:

The upgrade is currently budgeted in the Hydroelectric Upgrade funds for 2016.

attachment (1): HDR Proposal dated February 1, 2016.



February 1, 2016

Mr. Adrian Schneider
Nevada Irrigation District
1036 W. Main Street
Grass Valley, CA 95945

SUBJECT: Proposal for Consulting Engineering Services
Chicago Park Powerhouse Relay Upgrade

HDR Engineering, Inc. (HDR) respectfully submits to Nevada Irrigation District (NID) this proposal for engineering consulting services related to its Chicago Park Powerhouse Relay Upgrade Project.

DESCRIPTION OF PROPOSED SCOPE

BACKGROUND

Nevada Irrigation District owns and operates the Chicago Park Powerhouse. This facility was previously maintained through an agreement with PG&E in the same fashion as Dutch Flat No. 2 Powerhouse (part of NID's Yuba-Bear Hydroelectric Project). HDR has supported upgrades for PG&E at both Dutch Flat No. 2 and Chicago Park with relay upgrades following their project process and standards. NID would like to apply the same upgrades at Chicago Park similar to what was done for the Dutch Flat No. 2 Powerhouse completed in 2012 by HDR.

APPROACH

HDR proposes the following scope of work to modernize the line and generator relay protection scheme at Chicago Park Powerhouse. The work will be broken into discrete tasks to facilitate the design and procurement of relay panels and the detailed design for construction at the powerhouse. HDR will support NID for this effort by performing the following tasks:

1. Preliminary Engineering

1.1 Data Collection

HDR will work with NID to obtain related Chicago Park Powerhouse existing documentation expected to include drawings, Description of Operations, Bill of Materials along with the Plant Electrical Model. Under this task, HDR will request from NID and review drawings and other information relevant to the Chicago Park Relay Upgrade project to ensure all related and anticipated documents affected by the project are included in the design work and able to communicate the changes in sufficient details for the work projected.

1.2 Site Walk Down

A kickoff meeting with NID will be arranged followed by a site visit to Chicago Park to view the Powerhouse, obtain photos, and collect additional drawings. Discussions will be held with NID Operators, engineer, and maintenance personnel to obtain additional information relevant to the scope of work. HDR and NID will refine the scope of work



and the requirements for Chicago Park. This will include a discussion to define the interface between HDR and the Vendor’s scope and Contractor’s scope of work. Meeting minutes will be prepared to document the specific requirements of the project.

1.3 Design Criteria

Based on a review of the Chicago Park drawings, and discussions with NID, HDR will document the design requirements for the project in the form of a draft design criteria. This will include project approach, related standards and requirements for the relays that will be upgraded and anticipate effected documents.

1.4 Design Criteria Review

A conference call will be setup between NID and HDR to discuss the design criteria and finalize project requirements. HDR will then resolve comments and issues the Design Criteria establishing the design criteria for the project to follow moving forward.

Task 1 Deliverables

Task	Qty	Description
1.2	1	Site Walk down Agenda and Meeting Minutes
1.3	1	Draft Design Criteria
1.4	1	Design Criteria

2. Relay Design

2.1 50% Design Engineering

HDR will perform the detailed design engineering as described in the design criteria for Chicago Park Relay Upgrade project sufficient for a 50% level design. The design drawings will be developed using AutoCAD and anticipated to include the following:

- Single Line
- Three line meter and relay
- Arrangements
- Elementary
- Bill of Materials of major parts

2.2 Procurement Specifications

HDR will finalize the requirements for the new Relay Panels in the form of procurement specification that captures requirements for a Vendor to design, manufacture and supply relay panels.

2.3 QC review of Design

HDR will perform our standard quality process of review and comments resolution to ensure our deliverables are of high quality as expected from clients. The process for QA/QC review of the design documents will consist of detailed checks and assurance of procedures and process standards have been part of the design phase work and that all the information is included and accurate for the scope for work described above.

2.4 50% Design Review MTG

HDR will arrange and attend a one-day meeting with NID to review the 50% design package and procurement specifications. The meeting may occur at the site, but will at



a minimum include a site visit to verify drawings, site conditions and overall approach. HDR will submit an agenda and prepare meeting minutes from the meeting.

2.5 Finalize Design

HDR will resolve review comments and finalize the detailed engineering, design, and drafting following 50% Review meeting.

2.6 Finalize Bid Package

The bid package will need to contain all relevant documents for the contracting the supply, fabrication and testing of relay panels. The bid package is anticipated to comprise the following:

- Proposal Coversheet
- Proposal Form
- Division 1 – General Requirements
- Division 16 – Electrical
- Design Drawings
- Major Material BOM

Task 2 Deliverables

Task	Qty	Description
2.1	1 set	50% Design Documents <ul style="list-style-type: none"> • Design Drawings • Calculations • Bill of Material (Major Materials)
2.2	1	Draft Procurement Specifications
2.4	1	50% Design Review Meeting Agenda & Minutes
2.5	1	Conformed 50% Design Documents
2.6	1	Relay Panel Bid Package

3. Bid Services – Relay Panels

3.1 Bid Services

HDR will support NID’s procurement process by attending the Vendor bid walk, responding to NID Procurement and bidder RFI's during the process.

3.2 Proposal Evaluations

HDR will develop an evaluation criteria and matrix that will be used to score bidder’s proposals. A blank draft evaluation matrix will be provided to NID for review. After review and comment resolution the final evaluation matrix will be used to score bids based on their submitted proposal. The evaluation matrix is the tool used to document the procurement and selection process and it final justification.

3.3 Vendor Award

HDR will support NID in the selection of a Vendor by providing to NID a recommendation for selection of the Vendor to supply Relay Panels.



Task 3 Deliverables

Task	Qty	Description
3.1	3	Responses to Bidder RFIs
3.2	1	Draft Vendor Evaluation Matrix
3.3	1	Final Vendor Evaluation Matrix

4. Panel Manufacture

4.1 Vendor MTG

HDR will attend a site visit with NID and the vendor as part of the vendor’s required site visit. HDR will support NID with the technical details related to relay panels, their supply, integration and testing expectations.

4.2 Submittal Review

HDR will assist NID in the review of drawings and documents submitted by the Vendor for conformance with contract requirements. These submittals will also be used as input to HDR’s detailed design work. Based on past projects, the following Vendor submittals are expected to be reviewed by HDR:

- Panel Arrangements (2 DWGs)
- Material Data Sheets (4 DWGs)
- Wiring Diagrams (2 DWGs)

4.3 Panel Manufacture Support

HDR will interface with the Vendor during manufacturing to ensure that the Vendor’s design and HDR’s design are coordinated. HDR will respond to RFI’s during the fabrication of the panels. HDR will review factory test plans and provide comments to NID.

4.4 Factory Acceptance Test

HDR and NID will be present at the vendor’s facility during the shop factory acceptance test (FAT). This is expected to be a single day at a local panel shop.

Task 4 Deliverables

Task	Qty	Description
4.1	1	Vendor Meeting Agenda & Minutes
4.2	3	Vendor Submittal Review Comments
4.3	3	Responses to Fabrication RFIs
4.4	1	FAT Field Report



5. Detailed Design

5.1 90% Design

Comments from the 50% design review meeting will be resolved for the 90% design. The 90% package will include 50% drawings as well as the detailed wiring required for construction. HDR will perform the 90% design engineering for the Chicago Park Relay Upgrade project sufficient for a 90% level design anticipated to include the following:

- Single Line
- Three line meter and relay
- Arrangements
- Elementary
- Diagram of Connections

5.2 Test Plans

HDR will prepare a test and startup plan for the relays and associated control equipment. The test plan will be used to test the functionality and proper setup of the new equipment.

5.3 Relay Settings

HDR will use an electrical model to evaluate the relay settings. The transformer relays have already been upgraded to digital and NID shall provide settings to HDR. HDR will load the relay setting in an electrical model using (ETAP) to validate the settings resulting from the Mathcad development for each relay and protection element.

5.4 Construction Specifications

HDR will prepare construction specifications and RFP documentation to bid the construction work for this project.

5.5 QC review of Design

HDR will perform our standard quality process of review and comments resolution to ensure our deliverables are of high quality as expected from clients. The process for QA/QC review of the design documents will consist of detailed checks and assurance of procedures and process standards have been part of the design phase work and that all the information is included and accurate for the scope for work described above.

5.6 90% Design Review MTG

HDR will arrange and attend a one-day meeting with NID to review the 90% design package and procurement specifications. The meeting may occur at the site, but will at a minimum include a site visit to verify drawings, site conditions and overall approach. HDR will submit an agenda and prepare meeting minutes from the meeting.

5.7 Cost Estimate

HDR will provide a project cost estimate to a Class 3 level for input funding, estimate shall include estimated engineering, equipment, material, and construction costs. The Association for the Advancement of Cost Engineering (AACE) Class and Characteristics of the estimate will be provided as part of the submittal.



5.8 Finalize Design

HDR will resolve review comments and finalize the detailed engineering, design, and drafting following the 90% review meeting.

5.9 Finalize Bid Package

The bid package will need to contain all relevant documents for the contracting the supply and installation for the Relay project. The bid package developed by HDR is anticipated to comprise the following:

- Proposal Coversheet
- Proposal Form
- Division 1 – General Requirements
- Division 16 – Electrical
- Design Drawings
- Reference Drawings

Task 5 Deliverables

Task	Qty	Description
5.1	1 set	90% Design Documents <ul style="list-style-type: none"> • Design Drawings • Calculations • Bill of Material (Major Materials)
5.2	1	Draft Relay Test Plans
5.3	1	Draft Relay Settings
5.4	1	Draft Construction Specifications
5.6	1	90% Design Review Meeting Agenda & Minutes
5.7	1	Cost Estimate
5.8	1	Conformed Approved for Construction Documents
5.9	1	Contractor Bid Package

6. Bid Services - Construction

6.1 Bid Services

HDR will support NID’s procurement process by attending the Contractor bid walk, responding to NID Procurement and bidder RFI's during the process.

6.2 Proposal Evaluations

HDR will develop an evaluation criteria and matrix that will be used to score bidder’s proposals. A blank draft evaluation matrix will be provided to NID for review. After review and comment resolution the final evaluation matrix will be used to score bids based on their submitted proposal. The evaluation matrix is the tool used to document the procurement and selection process and it final justification.

6.3 Vendor Award

HDR will support NID in the selection of a Contractor by providing to NID a recommendation for selection of the Contractor to supply material and installation labor for the Chicago Park Relay Upgrade project.



Task 6 Deliverables

Task	Qty	Description
6.1	3	Responses to Bidder RFIs
6.2	1	Draft Contractor Evaluation Matrix
6.3	1	Final Contractor Evaluation Matrix

7. Construction Support

7.1 Kickoff Meeting

HDR will attend the construction kick off meeting with NID and the Contractor. A one day site visit is budgeted for this task.

7.2 Pre-outage

HDR will attend the pre-outage meeting if requested by NID. Attendance of this meeting should be discussed at the project kickoff. HDR will respond to requests for information (RFI’s) from the Contractor and NID related to Chicago Park Relay project prior to construction work commencing.

7.3 Construction

NID will oversee the daily on-site work by the Contractor by providing access and daily coordination with operations and maintenance staff.

7.4 Field Engineering Support

HDR will support construction in the field by visiting the site at the beginning and during construction. Support will consist of a minimum one day site visit the first or second week of construction, and weekly visits to the site as required. HDR will also respond to Contractor Requests for Information (RFI’s), confirm current drawings and design changes are on site and periodically check on progress of as-built markups.

7.5 Pre-commissioning

HDR will provide the services of implementing the test plan after construction is complete. Five days on site is estimated for this task. The test plan will be used to test the functionality and proper setup of the new equipment and will supplement the normal test and startup procedures.

7.6 Commissioning

HDR will provide the services of implementing the test plan after construction is complete. Five days on site is estimated for this task. The test plan will be used to test the functionality and proper setup of the new equipment and will supplement the normal test and startup procedures that will follow verification that the new relays and controls are ready for start-up of the unit.

7.7 Start-up

HDR will provide the services of implementing the startup plan after construction is complete and commissioning has been completed. A five day site trip is estimated for this task. The startup plan will be used to confirm the functionality and proper setup of the new equipment.



7.8 As-Built Documentation

HDR will perform an engineering review of the as-built markups produced during construction. In addition, an estimate of CAD work to incorporate the markups will be provided to NID.

7.9 AS-Built CADD

HDR has found that within 30 days of the release to operations date of the project, HDR will receive drawings based on a marked up, or “red-lined” package of drawings received from the field. Within 90 days of the release to operations date HDR the as-built drawings will be completed, distributed and filed in NID’s. HDR has estimated the hours to accomplish this task based on typical hours per drawing required on most projects.

8. Project Management

8.1 The following project management activities will be performed on an on-going basis throughout the project. Each of these tasks are not necessarily discrete tasks to be estimated separately but are to be included in the overall time allotted to the HDR’s project management.

- Project setup: Project management and project control activities associated with project setup.
- Work plan: Manage and coordinate the execution of the work plan.
- Invoicing: Project management and project control activities associated with invoicing
- QA/QC: Quality assurance and quality control activities to ensure deliverables meet requirements.
- Change control: Project management to deal with the scope, schedule, and cost aspects of any requested or required changes.
- Staffing, budget, and schedule control: Coordinate resource staffing. Project controls activities to track and control cost and schedule.
- Information Distribution & Monthly Cash Flow/Status Reporting: Distribute information between various team members. Prepare cash flows/status reports documenting work that has occurred, planned work, and project issues.
- Project Management and Coordination: Contract and project management / coordination.

8.2 Status Calls

HDR will conduct twice monthly project status conference calls for key stakeholders to keep up to speed on the project status. Agenda, action items and minutes will be developed and maintained for the project.

8.3 Project Closeout

HDR will compile and turn over all final project deliverables and close out the work coincident with completion of as-builts.



9. Assumptions:

- 9.1 NID will provide drawings requested with-in two week of each request.
- 9.2 NID will contract with Relay panel Vendor for materials.
- 9.3 NID will contract with Contractor for material and installation labor.
- 9.4 NID will provide daily construction management and inspection while Contractor is on-site at Chicago Park powerhouse.
- 9.5 NID will provide consolidated comments to HDR submittals with-in two week of receipt.
- 9.6 NID will provide technical services to program and test the digital relays for line, transformer and generator.
- 9.7 HDR will develop drawings using AutoCAD.
- 9.8 HDR will provide contact information during Construction to NID for quick response of construction related RFIs.

PROPOSED PROJECT SCHEDULE MILESTONES

HDR’s proposed project schedule milestones are as follows:

- HDR Notice to Proceed 2/15/16
- Preliminary Design Approach 3/28/16
- Relay Design 6/15/16
- Relay Panel NTP 8/15/16
- Relay Panel FAT 9/19/16
- Detailed Design 4/03/17
- Contractor NTP 6/05/17
- Outage Start 9/15/17
- Unit Return To Service 10/26/17
- Contract End Date 2/01/18

Additional schedule breakdown is shown in Attachment A (Project Schedule).

PROPOSED PROJECT TEAM AND 2016 RATE SCHEDULE

HDR’s proposed project team and 2016 rate schedule are as follows:

- Jeff Montano, PE – Project Manager (\$233.00)
- Praneesh Prasad, PE – Electrical Engineer (\$187.65)
- Gary Luu, PE – Electrical Engineer (\$179.83)
- Jorge Santamaria, EIT – Electrical EIT (\$110.00)
- Luc Nguyen, EIT – Electrical EIT (\$95.53)
- Ray DeLacruz, - Electrical Designer (\$91.99)
- Lisa Borba – Administrative Assistant (\$88.26)

Additional support staff may bill to the project on a limited basis. HDR’s task-level budget estimate is provided for summary purposes below. The overall funding request is \$243,628.



Task	Budget Estimate
1 – Preliminary Engineering	\$10,294
2 – Relay Design	\$47,071
3 – Bid Services – Relay Panels	\$8,533
4 – Equipment Manufacture	\$10,763
5 – Detailed Design	\$59,407
6 – Bid Services - Construction	\$8,492
7 – Construction Support	\$62,728
8 – Project Management	\$36,340
Overall Proposal	\$243,628

The proposed scope of work would be executed as a new task order under the existing Agreement for Consulting Services between NID and HDR, dated February __, 2016. Any new staff additions to the project would require the written approval of NID’s Project Manager.

If you have any questions regarding this proposal, please feel free to call me at 916-679-8819 or email me at jeffrey.montano@hdrinc.com.

Sincerely,

Jeffrey Montano, PE
Engineering Manager