

## FOR BOARD ACTION

Agenda Item # 4

Meeting Date:

1/25/11

**SUBJECT:**

Geothermal Optimization Project

**PREPARED BY:**

Bill Cook, Manager Work Management and Integrated Services

ITEM DESCRIPTION:

September of 2009 the City of Rochester was approved for a federal Energy Efficiency and Conservation Block Grant (EECBG). One of the approved activities was a cooperative effort with Rochester Public Works (RPW) to install a geo-lake plate system, header vault, equipment, and piping. The last element of that activity is to connect the piping into the Service Center HVAC system.

The Geothermal Optimization Project includes three components; the connection to the geo-lake plate system, replacement of gas-fired unit heaters in the Fleet garage with geothermal based hydronic (hot water) units, and conversion of the perimeter heat system to geothermal hydronic heating. The last two components were recommended in the Service Center Energy Audit completed in November 2009.

MEP Associates and Arizona State University Performance Based Studies Research Group (ASU-PBSRG) have been commissioned to assist RPU in preparing documents and proposal evaluation for the project. A decision was made to use the Best Value Procurement (BVP) process rather than lowest responsible bidder approach. BVP includes a rating system for the proposals and does not require selection of the low bid. Minnesota state statutes allow the BVP process and it has been used extensively by the state. BVP has been used recently by the City on the Public Works and Transit Operations Center project, by Olmsted County on the new building on the county campus and by the Rochester School District. ASU-PBSRG has been involved in all of the local projects described and has significant experience in the BVP process in Minnesota. This is RPU's second BVP project.

Five vendors attended the required pre-bid meeting with four submitting proposals on December 22<sup>nd</sup>, 2010. The four submitting proposals were Dimension, Himec, Neitz, and Superior. Proposals consisted of: past performance survey, cost quotation, schedule and risk assessment & value added (RAVA) plan. An evaluation panel, made up of three RPU staff and one external person, reviewed the RAVA plan and assigned scores on a relative scoring system. ASU-PBSRG reviewed RAVA plans only as a quality check in the process. The overall evaluation included past performance, cost, schedule and RAVA plan; the results are attached. Based on the evaluation Management is recommending Superior Mechanical.

The proposals were structured based on the three components.

- Base Proposal      Connection of Geo-Lake Plate System
- Alternate 1        Geothermal Based Hot Water Units
- Alternate 2        Conversion of Perimeter Heat to Geothermal

  
General Manager

1-20-2011  
Date

**ROCHESTER PUBLIC UTILITIES**

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Business case analysis was performed for both alternates. Alternate 1 demonstrates a simple payback of 12 years and 16 years on a discounted basis. Alternate 2 provides simple payback in just over 4 years and 5 on a discounted basis. Life expectancy of the system is 30 years or more. The payback periods on the Alternates are within the design life of the equipment.

Significant environmental benefits would also be realized. Both alternates were recommendations of the RPU Energy Audit and advance the Service Center towards LEED standards. Fossil fuel consumption will be reduced, as will resulting emissions of CO<sub>2</sub>, SO<sub>2</sub>, and NO<sub>x</sub>. Maintenance costs should be substantially less as compared to the existing natural gas-fired system. Seven exhaust stacks will be eliminated thereby avoiding roof penetrations that have been problematic in the past.

Overall benefits of the project, including base proposal and both alternates are sufficient to recommend proceeding.

### FOR CAPITAL PURCHASES/BIDS/MAJOR PROJECTS:

Funding for this project comes from remaining Federal Recovery Act EECBG grant funds of approximately \$100,000 and the 2011 Facilities capital budget.

### UTILITY BOARD ACTION REQUESTED:

Management recommends that the Board approve a contract agreement in the amount of \$503,165 with Superior Mechanical, and that the Mayor and City Clerk execute the agreement.

\_\_\_\_\_  
General Manager

\_\_\_\_\_  
Date



January 20, 2011

Rochester Public Utilities  
Attn: Mr. Joe Hensel  
4000 East River Road NE  
Rochester, MN 55906

**Re: Customer Service Center Geolake Plate Connection Project, MEP Project No. R13.10.02**

Dear Mr. Hensel:

On December 22, RPU received Best Value Proposals for the Geolake Plate Connection project at the Customer Service Center. Four local mechanical contractors submitted proposals.

A potential best value contractor was identified by evaluating and scoring the submitted proposals using the Arizona State University Best Value scoring system. Superior Mechanical was identified as the Potential Best Value Contractor and was invited to participate in the Pre-Award Phase of the procurement process.

RPU and MEP Associates have been coordinating with Superior Mechanical following proposal selection to aid in preparing the Pre-Award document. The Pre-Award document describes the contractor's plan for completing the project within their proposed budget and schedule. It also ensures the contractor has addressed all risks identified by all proposing vendors and RPU. Superior has completed the Pre-Award document and presented it to RPU and MEP Associates. MEP Associates has no objections to the information provided by Superior Mechanical in the Pre-Award document. MEP recommends acceptance of Superior Mechanical's proposal.

The Request for Proposal included two alternates to be priced separately to give RPU the opportunity to prioritize the different aspects of this project. The two alternates are energy conservation projects based on the findings of the Technical Energy Audit performed by MEP Associates in 2010. The following is a brief description of each alternate.

**Alternate 1.** Replace Gas-Fired Unit Heaters in Fleet Garage with hot water unit heaters. The new hot water unit heaters will be served by the geothermal heat pump system. The geothermal heat pump system is much more efficient than the existing gas-fired units. This will decrease natural gas consumption by approximately 10,000 therms per year.

**Alternate 2.** Convert perimeter heat to be served from geothermal system. Currently, the perimeter heat throughout the Service Center is served by a gas-fired hot water boiler. This alternate would implement piping and controls to allow RPU to utilize the geothermal system to provide hot water to the perimeter heat. The geothermal system is much more efficient and does not consume any natural gas. The calculated energy savings is \$4,100 per year.

Superior Mechanical included three Value Added options in their proposal. The following is a brief description of each Value Added option.

1. **Item 1.** Base Bid – Change Geothermal piping from Roll Grooved to PVC reducing the project cost and labor hours and material costs for the Mechanical Contractor, reducing the total time to complete the project. PVC is commonly used piping in Geothermal systems with similar temperatures to this project. This Value Added option has a deduct price of \$19,720. Recommend not accepting.
2. **Item 2.** Alternate 1 – Change Welded/Copper hydronic piping (in fleet garage) to Roll Grooved. This would save labor hours and material costs for Mechanical Contractor, reducing total project cost and overall time to complete the project. Roll Grooved piping is a common type of pipe for this application. This Value Added option had a deduct price of \$42,900. Recommend accepting.
3. **Item 3.** Alternate 2 - Change Welded/Copper hydronic piping to Roll Grooved. This would save labor hours and material costs for Mechanical Contractor, reducing total project cost and overall time to complete the project. Roll Grooved piping is a common type of pipe for this application. This Value Added option had a deduct price of \$6,940. Recommend accepting.

## Pricing

The following table summarizes the various project costs and shows how they compare to the original engineering estimates.

	Estimate	Base Bid	Value Add Deduct
Geolake Plate Connection	\$273,525.00	\$306,775.00	\$19,720.00
Alternate 1	\$145,505.00	\$220,210.00	\$42,900.00
Alternate 2	\$20,000.00	\$26,020.00	\$6,940.00
<b>TOTALS</b>	<b>\$439,030.00</b>	<b>\$553,005.00</b>	
<i>Include Recommended Value Added Options</i>		<i>\$503,165.00</i>	

Bids for all components were higher than our estimate. We believe the reason for the difference is due to further refinements in the design after the final cost estimate was performed. Also, the cost

estimate included a 10% contingency, but that most likely did not allow the proper amount for price escalation of materials and equipment.

#### Summary

MEP Associates recommends that RPU accept Superior Mechanical's proposal. Value added options for the Alternates are recommended should either Alternate be accepted.

If you have any additional questions prior to making your final decision, please feel free to contact us.

MEP Associates, LLC

A handwritten signature in black ink, appearing to read "Brett Gorden", written in a cursive style.

Brett Gorden, PE

## RPU Geothermal Optimization

### Project Best Value Scores

		862	900	861	649
No	Criteria	Vendor 1	Vendor 2	Vendor 3	Vendor 4
1	Base Proposal Cost	220.1	300.0	238.9	174.5
2	Temperature Control	0.0	0.0	0.0	0.0
3	Project Duration	93.3	73.0	150.0	56.0
4	Alternate No. 1 cost	0.0	0.0	0.0	0.0
5	Temperature Controls	0.0	0.0	0.0	0.0
6	Project Duration Alternate 1	0.0	0.0	0.0	0.0
7	Alternate No. 2 cost	0.0	0.0	0.0	0.0
8	Temperature Controls	0.0	0.0	0.0	0.0
9	Project Duration Alternate 2	0.0	0.0	0.0	0.0
10	RAVA Rating	350.0	328.1	273.4	218.8
ME1	Ability to manage the project cost	9.9	9.9	9.9	10.0
ME2	Ability to maintain project schedule	10.0	9.8	10.0	10.0
ME3	Quality of workmanship	10.0	10.0	10.0	10.0
ME4	Professionalism and ability to manage	10.0	9.9	10.0	10.0
ME5	Close out process	10.0	9.8	9.9	10.0
ME6	Communication, explanation of risk, and documentation	10.0	9.9	10.0	10.0
ME7	Ability to follow the users rules, regulations and requirements	10.0	9.9	10.0	10.0
ME8	Overall customer satisfaction	10.0	10.0	10.0	10.0
ME9	Total number of different jobs	10.0	10.0	10.0	10.0
ME10	Total number of different customers	9.0	10.0	9.0	10.0
ES1	Ability to manage the project cost	10.0	10.0	10.0	10.0
ES2	Ability to maintain project schedule	10.0	10.0	10.0	10.0
ES3	Quality of workmanship	10.0	10.0	10.0	10.0
ES4	Professionalism and ability to manage	10.0	10.0	10.0	10.0
ES5	Close out process	10.0	10.0	10.0	10.0
ES6	Communication, explanation of risk, and documentation	10.0	10.0	10.0	10.0
ES7	Ability to follow the users rules, regulations and requirements	10.0	10.0	10.0	10.0
ES8	Overall customer satisfaction	10.0	10.0	10.0	10.0
ES9	Total number of different jobs	10.0	10.0	10.0	10.0
ES10	Total number of different customers	10.0	10.0	10.0	10.0

## RPU Geothermal Optimization

### Bid Tabulation

Component	Vendor 1	Vendor 2	Vendor 3	Vendor 4
Base Proposal Cost	\$ 348,900	\$ 255,975	\$ 321,500	\$ 440,050
Temperature Control	\$ 50,800	\$ 50,800	\$ 50,800	\$ 50,800
Subtotal	\$ 399,700	\$ 306,775	\$ 372,300	\$ 490,850
Alternate No. 1 cost	\$ 154,900	\$ 207,310	\$ 146,400	\$ 127,500
Temperature Controls	\$ 12,900	\$ 12,900	\$ 12,900	\$ 12,900
Subtotal	\$ 167,800	\$ 220,210	\$ 159,300	\$ 140,400
Alternate No. 2 cost	\$ 36,990	\$ 15,620	\$ 31,800	\$ 24,900
Temperature Controls	\$ 10,400	\$ 10,400	\$ 10,400	\$ 10,400
Subtotal	\$ 47,390	\$ 26,020	\$ 42,200	\$ 35,300

Grand Total	\$ 614,890	\$ 553,005	\$ 573,800	\$ 666,550
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Recommend Value Add Options	\$ (49,840)
Contract Total	\$ 503,165

### Proposed Project Budget

Component	Proposal Price	Value Add Option	Total
Base Proposal	\$ 306,775	\$ -	\$ 306,775
Alternate No. 1 cost	\$ 220,210	\$ (42,900)	\$ 177,310
Alternate No. 2 cost	\$ 26,020	\$ (6,940)	\$ 19,080

**Total Project \$ 503,165**



## RESOLUTION

BE IT RESOLVED by the Public Utility Board of the City of Rochester, Minnesota, to approve a contract agreement with Superior Mechanical, and that Mayor and the City Clerk execute the agreement for

### Geothermal Optimization Project

The amount of the contract agreement to be FIVE HUNDRED THREE THOUSAND ONE HUNDRED SIXTY-FIVE AND 00/100 DOLLARS (\$503,165.00).

Passed by the Public Utility Board of the City of Rochester, Minnesota, this 25<sup>th</sup> day of January, 2011.

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President

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Secretary