



City of Grand Island

Tuesday, March 26, 2019

Council Session

Item G-22

#2019-118 - Approving Repair of Vertical Turbines at Island Oasis Water Park

Staff Contact: Todd McCoy, Parks & Recreation Director

Council Agenda Memo

From: Todd McCoy, Parks and Recreation Director

Meeting: March 26, 2019

Subject: Repair of Two (2) Vertical Turbine Pumps at Island Oasis Water Park

Presenter(s): Todd McCoy, Parks and Recreation Director

Background

Island Oasis Water Park opened to the public in the summer of 1993. The lazy river was added in 1999 and the speed slides added in 2002. Some of the pumps and motors that propel water throughout the sanitation system and filters have aged to the point that the performance and reliability has become a concern.

Discussion

After the 2018 swim season the Grand Island Utility Department helped the Parks and Recreation staff remove several motors and pumps at Island Oasis for evaluation and potential repair. Two (2) of the vertical turbine pumps that operate the lazy river were sent off to Engineering Pump Service, Inc. of Mukwonago, Wisconsin for cleaning and inspection. The inspection fee was \$1,200.00 each for a total of \$2,400.00. During inspection Engineering Pump Service found that the pumps were in need of a complete overhaul.

Because complete pump overhaul was unanticipated and lengthy lead time, City Procurement Agent Stacy Nonhof has waived the typical practice of a formal bid in this unique situation. Based off the inspection report, three (3) quotes were requested to insure the City was receiving a fair price for the work.

	Pump #1	Pump #2	Total
Engineered Pump Services	\$13,115.00	\$13,215.00	\$26,330.00
JCI Industries of Lincoln, NE	\$13,079.00	\$13,927.00	\$27,006.00
RERpump of Sussex, WI	\$34,214.00	\$35,619.00	\$69,833.00
Hydro Inc. of Chicago, IL	No bid, no response to bid		

Staff recommends accepting the quote from Engineered Pump Services in the amount of \$26,330.00 to overhaul the two (2) vertical turbine pumps.

Alternatives

It appears that the Council has the following alternatives concerning the issue at hand. The Council may:

1. Move to approve
2. Refer the issue to a Committee
3. Postpone the issue to future date
4. Take no action on the issue

Recommendation

City Administration recommends that the Council approve the repair of two (2) vertical turbine pumps for Island Oasis Water Park from Engineered Pump Services, Inc. of Mukwonago, Wisconsin in the amount of \$26,330.00 including the inspection fee amount of \$2,400.00 for a total purchase price of \$28,730.00.

Sample Motion

Motion to approve the repair of two (2) vertical turbine pumps and inspection fee for Island Oasis Water Park in the final amount of \$28,730.00.



Engineered Pump Services, Inc.

624 Perkins Dr
Mukwonago, WI 53149
Phone: 262-363-9002
Fax: 262-363-9013

Quotation

Quote City of Grand Island

To: Platte Generating Station
1035 West Wildwood Drive
Grand Island, NE 68801
United States

Quote Number:	66706	Contact:	Mike Steinke
Quote Date:	03/05/19	Expires:	04/04/19
Customer:	CITYGRANDISL	Inquiry:	
Salesman:	Doug Braun-Dex/Tec House	Terms:	Net 30 Days
Ship Via:	Best Way Truck	Phone:	(308) 385-5468
FOB:	Factory	FAX:	(308) 385-5353

City of Grand Island - Parks Dept.: Verti-Line 13 MKEH vertical bowl pump disassemble, clean and inspect with firm price to complete overhaul.

Part Number

<u>Item</u>	<u>Description</u>	<u>Revision</u>	<u>Quantity</u>	<u>Price</u>
1	128-601-13MKEH Layne/Verti-Line 13 MKEH Assembly; Complete disassembly, cleaning and inspection.	01	1	\$1,200.0000 /EA
2	128-600-56047 Layne/Verti-Line 13 MKEH Overhaul; Provide new parts and complete repairs to overhaul and assemble the complete pump in accordance with the attached Recommended Repair Specification		1	\$13,215.0000 /EA

Total: \$14,415.00

Thank you for the opportunity to submit this quote!


By Douglas E Braun
Engineered Pump Services, Inc.



ENGINEERED PUMP SERVICES, INC.

624 Perkins Drive • Mukwonago, WI 53149-1454
(262) 363-9002 • (800) 657-0845 • fax (262) 363-9013
www.epspumps.com • email: eps@epspumps.com

INSPECTION REPORT

CUSTOMER	: CITY OF GRAND ISLAND	REPORT DATE	: 2/22/2019
PLANT NAME	: PARKS DEPARTMENT	REPORT NO.	: 56047-IR1
CITY/STATE	: GRAND ISLAND, NE	CUST. ORDER	:
EQUIPMENT	: 13 MKEH SINGLE STAGE	COPY	: MIKE STEINKE
SERVICE	: WATER PARK		
MANF.	: LAYNE/VERTI-LINE	FILE	: 56047
SERIAL NO.	: 97-14987	PAGE	: 1 of 5

On 1/25/19, the pump as referenced above arrived at the EPS facility. It was disassembled, cleaned, dimensionally and visually inspected. The results of the inspection are outlined in the following report.

I. ROTATING COMPONENTS

- 1) Pump Shaft -
 - a) The pump shaft was found to be in poor condition.
 - b) The TIR of the shaft was found to be .0045.”
 - c) The as-measured fit turns were found to be worn undersize and pitted as seen in photo 1.
 - d) No further inspection was carried out.
- 2) Upper Shaft –
 - a) The upper shaft was found to be in poor condition.
 - b) The TIR of the shaft was found to be .024”, which is excessive.
 - c) The journal turns are worn undersize, as seen in photo 2.
 - d) No further inspection was carried out.
- 3) Impeller –
 - a) The impeller was found with heavy cavitation damage present on each of its vanes, as seen in photograph 3.
 - b) The wear turn is excessively worn as seen in photo 4.
 - c) The fit bore measured round with a 1:16 taper.
 - d) The impeller sleeve was not measurable due to being cut off for disassembly.
- 4) Shaft Couplings –
 - a) The shaft couplings were cut in half for disassembly.

BY: *Jacob Simon*

INSPECTION REPORT

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II. STATIONARY COMPONENTS

- 4) Suction Piece -
 - a) The suction piece is moderately corroded.
 - b) The fit turn measured \varnothing 10.060-10.065.
 - c) The wear bore is excessively worn as seen in photo 5.
 - d) The bearing ID measured \varnothing 1.718-1.730.

- 5) Diffuser (Bowl) –
 - a) The diffuser casing has presence of heavy corrosion pitting as seen in photo 6.
 - b) The diffuser fit turn measured \varnothing 10.060-10.065 and the fit bore measured \varnothing 10.065-10.070.
 - c) The diffuser bearing ID measured \varnothing 1.714-1.725.

- 6) Intermediate Casing –
 - a) The intermediate casing has presence of heavy corrosion pitting as seen in photo 7.
 - b) The intermediate casing fit bore measured \varnothing 10.077-10.079.
 - c) The bearing ID measured \varnothing 1.728-1.739.

- 7) Column –
 - a) The column is not in serviceable condition. The column had to be cut for disassembly as seen in photo 8.
 - b) The column fit turn measured \varnothing 10.994-10.997.

- 8) Discharge Elbow –
 - a) The discharge elbow is in serviceable condition.
 - b) The discharge fit bore to the column measured \varnothing 11.002-11.003 and the fit bore for the stuffing box measured \varnothing 6.005-6.010.

- 9) Cap Screws and Nuts –
 - a) The cap screws and nuts will need to be replaced.

- 10) Stuffing Box –
 - a) The stuffing box is in serviceable condition.
 - b) The fit turn measured \varnothing 5.995-6.000.

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Summary of Fits and Clearances

Stationary Components	Bore	Turn	Clearance
Diffuser Bore to Suction Turn	10.065 to 10.070	10.060 to 10.065	0.000 to 0.010
Int. Casing Bore to Diffuser Turn	10.077 to 10.079	10.060 to 10.065	0.012 to 0.019
Discharge Head Bore to Column Turn	11.002 to 11.003	10.994 to 10.997	0.005 to 0.009
Discharge Head Bore to Stuffing Box Turn	6.005 to 6.010	5.995 to 6.000	0.005 to 0.015

Stationary to Rotating Components	Bore	Turn	Clearance
Suction Wear Bore to Impeller Wear Turn	7.897 to 7.918	7.713 to 7.793	0.104 to 0.205
Suction Bearing Bore to Shaft Journal	1.718 to 1.730	1.684 to 1.684	0.034 to 0.046
Diffuser Bearing Bore to Shaft Journal	1.714 to 1.725	1.685 to 1.686	0.028 to 0.040
Int. Casing Bearing Bore to Shaft Journal	1.728 to 1.739	1.685 to 1.685	0.043 to 0.054
Stuffing Box Bearing Bore to Shaft Journal	1.515 to 1.518	1.472 to 1.498	0.017 to 0.046

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III. PHOTOGRAPHS



1. Worn and pitted journal turns on pump shaft.



4. Impeller wear turn.



2. Worn and undersize journal turns on upper shaft.



5. Suction piece flange face and wear bore.



3. Heavy cavitation damage present on each of its vanes.

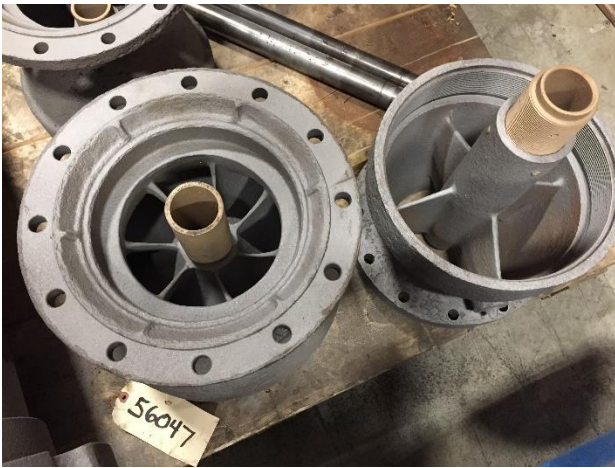


6. Diffuser fit bore and corroded vanes.

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7. Diffuser and intermediate casing.



10. Stuffing box.



8. Cut column for disassembly.



11. Pump as delivered.



9. Column fit turn.



ENGINEERED PUMP SERVICES, INC.

624 Perkins Drive • Mukwonago, WI 53149-1454
(262)363-9002 • (800)657-0845 • fax (262) 363-9013
www.epspumps.com • email: eps@epspumps.com

RECOMMENDED REPAIR SPECIFICATION

Ref. EPS Order : 56047
Customer order:
Page : 1 of 2 pages

Quotation No. : 66706
Quotation date : 3/5/2019
Ref. EPS Report : 56047-IR1

City of Grand Island
Parks Department
Layne/Verti-Line 13 MKEH Water Park Pump

A) RECOMMENDED NEW PARTS

Qty.	Part Description	Material
1	Impeller	Bronze
1	Sand Collar	416 SS
1	Pump Shaft	416 SS (PSQ)
1	Upper Shaft	416 SS (PSQ)
1	Collet	416 SS
2	Coupling (Intermediate & Top)	416 SS
1	Column	Carbon Steel
1	Stuffing Box Bearing	Graphalloy
1	Suction Piece Bearing	Graphalloy
1	Diffuser Bearing	Graphalloy
1	Int. Casing Bearing	Graphalloy
Set	Gaskets, As Required	Klinger
Set	O-Rings, As Required	Buna
Set	Hardware, As Required	Grade 5 or Better

B) RECOMMENDED REPAIRS

- 1) Stuffing Box –
 - a) Pad weld the fit turn to the discharge elbow.
 - b) Remove the old bearing and inspect the fit bore.
 - c) Finish machine the pad welded turn to reestablish the proper fit to the discharge elbow.
 - d) Install the new bearing and finish machine the bore to the design size specified.
 - e) Coat the stuffing box with one coat of red oxide primer.

- 2) Discharge Elbow –
 - a) Set up in the machine and:
 - Machine the fit bore to reestablish the proper fit to the column.
 - Minimum skim cut the mounting faces to true up.
 - Minimum machine the fit bore to the stuffing box to reestablish the fit.
 - b) Coat the discharge elbow with one coat of red oxide primer, and one coat of grey enamel.

City of Grand Island – Parks Department
Layne/Verti-Line 12 RH Water Park Pump

B) RECOMMENDED REPAIRS (continued)

3) Diffuser –

- a) Pad weld the fit turn to the column.
- b) Set up in the machine and:
 - Machine fit bore to reestablish the proper fit to suction bell.
 - Machine the pad welded fit turn to reestablish the proper fit to the column.
 - Minimum skim cut mounting faces to true up.
- c) Coat exterior and wetted passages with one coat of marine epoxy.

4) Suction Piece –

- a) Pad weld the fit turn to the diffuser.
- b) Set up in the machine and:
 - Machine the pad welded fit turn to reestablish the proper fit to the column.
 - Minimum skim cut mounting faces to true up.
- c) Coat exterior and wetted passages with one coat of marine epoxy.

5) Intermediate Casing –

- a) Set up in machine and:
 - Machine the fit bore to reestablish the proper fit to the diffuser.
 - Minimum skim cut the mounting faces to true up.
 - Chase threads to clean up.
- b) Coat exterior and wetted passages with one coat of marine epoxy.

6) Assembly –

- a) Assemble the lower element complete in the vertical position and document the float at each stage.
- b) Complete the assembly to include the upper element and touch up the exterior with marine epoxy.
- c) Prepare the pump for shipment and secure to a new shipping skid.
- d) Furnish a closing report to include all pertinent photographs, as-achieved fits and clearances, and balance results.

RESOLUTION 2019-118

WHEREAS, the Island Oasis Water Park is operated by the City Parks & Recreation Department and the vertical turbine pumps are in need of repair/overhauling; and

WHEREAS, three (3) quotes were received and reviewed; and

WHEREAS, the pumps were taken apart and inspected and it was discovered that the pumps needed extensive repair than originally estimated thus taking the repair price over the \$20,000 threshold; and

WHEREAS, due to special circumstances, the nature of the work and the necessity of the work needing done as quickly as possible and the fact that the formal bid process would take us well past the Water Park opening date we were granted permission to forgo the formal bid process.

NOW, THEREFORE, BE IT RESOLVED BY THE MAYOR AND COUNCIL OF THE CITY OF GRAND ISLAND, NEBRASKA, that the vertical turbine pump repairs at Island Oasis Water Park in the amount of \$26,330.00 including the inspection fee of \$2,400.00 for a total purchase price of \$28,730.00 from Engineered Pump Services from Mukwonago, Wisconsin is hereby approved.

- - -

Adopted by the City Council of the City of Grand Island, Nebraska, March 26, 2019.

Roger G. Steele, Mayor

Attest:

RaNae Edwards, City Clerk

Approved as to Form	☐ _____
March 22, 2019	☐ City Attorney