

Mayor  
NELSON P.  
CRABB

August 30, 2013

City  
Administrator  
SCOTT  
FLORY

HONORABLE MAYOR & CITY COUNCIL MEMBERS:

The next meeting of the Clear Lake City Council is scheduled for Tuesday, **September 3, 2013**, at 6:30 p.m., in the Council Chambers, at City Hall. Please refer to the enclosed agenda for the items discussed below.

COUNCIL  
MEMBERS

DANA  
BRANT  
Ward 1

TONY J.  
NELSON  
Ward 2

JIM  
BOEHNKE  
Ward 3

MIKE  
CALLANAN  
At Large

TERRY  
UNSWORTH  
At Large

ITEM #6A. **Water Treatment Plant High Service Pump Report**. In June, the Council authorized an engineering services agreement with Veenstra & Kimm to assess the existing condition of the Water Treatment Plant's High Service Pumps and make recommendations regarding potential needs. This was in response to some prior operational issues with one of the Water Treatment Plant's High Service Pumps. The cost of the engineering services agreement was \$6,000.

The Treatment Plant has four (4) High Service Pumps, however, one of those has not been operational for many years and is not critical to the system's operations. The three (3) remaining pumps (#1, #2, & #3) were installed in 1972, 1989, and 1948, respectively. Although each has been re-conditioned, the most recent effort in that regard was more than 23 years ago. Generally, these pumps have a life expectancy of 20-25 years.

The Evaluation Report has identified that all three (3) of the High Service Pumps critical to the operation of the Water Treatment Plant are in "fair" or "poor" condition. Re-use of the existing pumps is not recommended due to size/capacity and age. It is also recommended that the City consider replacement of the facility's back-up generator, which is now 22 years old and capable of manual operation only. The back-up generator is also not capable of handling the majority of the Water Treatment Plant load.

The Council will review the engineering report's findings and conclusions with the consultant. If so inclined, the Council will then authorize the Report to be submitted to the Iowa DNR. Additionally, the Council will give staff direction regarding next steps in terms of proceeding with a capital project.



The Report identifies the potential cost of construction, including: miscellaneous modifications to the treatment plant, installation of new high service pumps, valves, humidity control, electrical and instrumentation at \$479,000, including 10% contingency. This does not include engineering and consultant fees.

**ITEM #6B. Pine Brooke 3<sup>rd</sup> Residential Subdivision.** At its regular meeting on May 6, 2013, the Council approved the Final Plat for Pine Brooke 3<sup>rd</sup> Residential Subdivision. The subdivision is, of course, located just north of 10<sup>th</sup> Ave N., between Buddy Holly Place and Pine Brooke Drive. The development contains nine (9) residential building lots located on roughly 2.6 acres. The lots are all zoned RM-12 (low-density multi-family residential).

Concurrently with the filing of the Final Plat and as a prerequisite to approval, the Developer posted a Letter of Credit in an amount equal to the cost of constructing the remaining infrastructure improvements. Those improvements have now all been completed. The Project consulting engineer has filed a Certificate of Completion with an updated "Punchlist" documenting the final work items as complete.

The total construction cost of the Project was \$256,345.81. There is a two (2) year maintenance bond on the improvements, which begins from the date of the acceptance by the developer and City.

**ITEM #6C. 14<sup>th</sup> Ave S. Public Approach Project.** At its last meeting, the Council rejected the sole bid it received for the project and directed the consulting engineer to revise the project plans and specifications to exclude the porous paving component and include alternates for both PCC and HMA paving. There will also be some incidental storm sewer work required as a result of the change in pavement as well. The estimated construction cost of the PCC paving project is \$21,890 and the HMA paving alternative is \$18,315. It is recommended to set the date for receiving sealed quotations at September 11, 2013, at 2:00 p.m.

Scott Flory  
City Administrator

Smart Quote: "**We don't know who we are until we see what we can do.**"  
– Martha Grimes, American writer

TENTATIVE AGENDA  
CLEAR LAKE CITY COUNCIL  
CITY HALL – 15 N. 6<sup>TH</sup> STREET  
TUESDAY, SEPTEMBER 3, 2013  
CITY HALL – COUNCIL CHAMBERS  
**6:30 P.M.**

1. Call To Order by Mayor Nelson P. Crabb.
2. Approval of Agenda.
3. Consent Agenda:
  - A. Minutes – August 19, 2013.
  - B. Approval of the bills & claims.
  - C. Licenses & Permits:
    - Liquor License: Class B Wine Permit & Class C Beer Permit with Sunday Sales, Shell Food Mart, (renewal).
    - Street Closing Request: Clear Lake Area Chamber of Commerce, Harvest Festival, Saturday, October 5<sup>th</sup>.
4. Citizen's opportunity to address the Council on items not on the agenda:
  - In conformance with the City Council's Rules of Procedure, no action can occur on items presented during the Citizens Forum.
  - Please walk to the lectern, state your name (spell last name), address, and subject of your discussion.
  - Speakers are limited to a maximum of five (5) minutes per person.
5. Unfinished Business:
6. New Business:
  - A. Water Treatment Plant High Service Pumps Evaluation Report:
    - Introduction by Scott Flory, City Administrator.
    - Review of report by Jason Petersburg, P.E., Veenstra & Kimm.
    - **Motion** to authorize the High Service Pump Evaluation Report to be submitted to the Iowa DNR for approval.
    - Discussion and consideration of **Motion** by City Council.

B. Pine Brooke Residential Subdivision (Phase 3):

- Review of proposal, Scott Flory, City Administrator.
- **Motion** to approve **Resolution #13-58**, "A Resolution of the City Council of the City of Clear Lake, Iowa, accepting the offer of dedication for street right-of-way and easements for public use as shown on the final plat, accepting the public improvements (water, sanitary sewer, storm sewer, & street with all related improvements) for maintenance, accepting the subdivision maintenance bond, and releasing the subdivision performance guarantee for Pine Brooke 3<sup>rd</sup> Subdivision by City Council.
- Discussion and consideration of **Motion** by City Council.

C. 14<sup>th</sup> Avenue S. Public Approach Enhancement Project:

- Review of revised plans & specifications by Mike Danburg, P.E., Yaggy Colby Associates.
- **Motion** to set September 11, 2013, at 2:00 p.m., as the date and time for receiving sealed quotations by City Council.
- Discussion and consideration of **Motion** by City Council.

7. Chief of Police's Report:

8. Mayor's Report:

9. Public Works Director's Report:

- Pre-construction conference: Northwest Water Tower Improvement Project.
- Update regarding the US HWY 18 (N. 3<sup>rd</sup> St. W. - N. 9<sup>th</sup> St. W.) Water Main Improvement Project.
- Update regarding the S. 20<sup>th</sup> Street Intersection(s), Stormwater, & Sidewalk Project.

10. City Administrator's Report:

11. City Attorney's Report:

12. Other Business:

13. Adjournment.

NEXT REGULAR MEETING – SEPTEMBER 16, 2013

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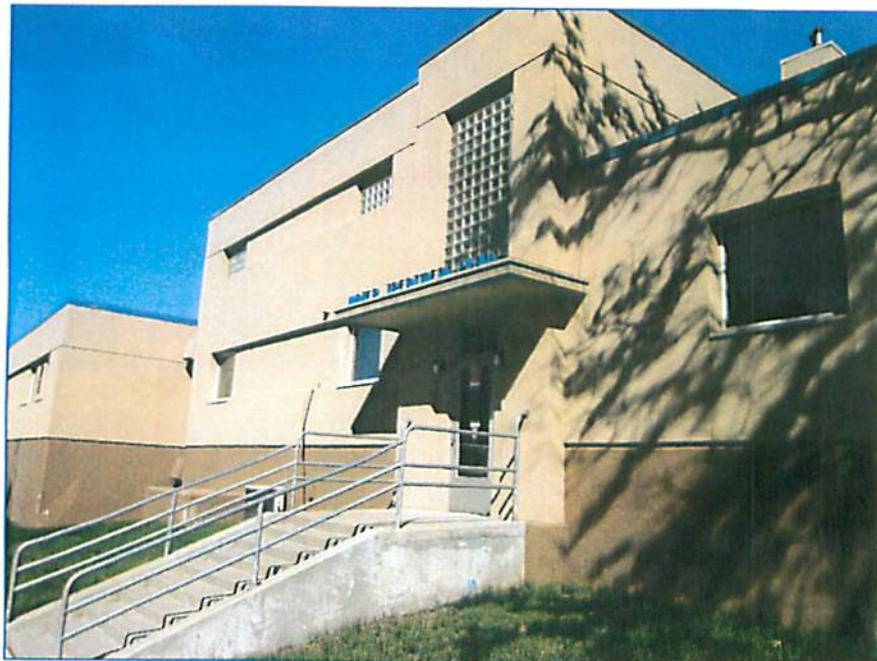
PRELIMINARY REPORT

ON

***HIGH SERVICE PUMPS EVALUATION***

***CLEAR LAKE, IOWA***

***July 2013***



VEENSTRA & KIMM, INC.

**REPORT**

**ON**

**HIGH SERVICE PUMPS EVALUATION**

**CLEAR LAKE, IOWA**

**JULY 2013**

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.



Signed:

Date:



8/29/13

Mark A. Seip, P.E.

Iowa License No. 13923

My license renewal date is December 31, 2014

Parts covered by this seal:

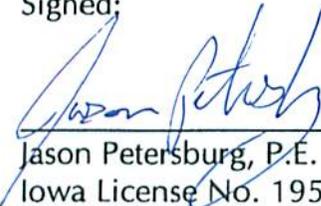
All

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.



Signed:

Date:



8/29/13

Jason Petersburg, P.E.

Iowa License No. 19517

My license renewal date is December 31, 2014

Parts covered by this seal:

All

Prepared by  
VEENSTRA & KIMM, INC.  
Mason City / West Des Moines,  
Iowa

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### **APPENDIX**

APPENDIX A – MANUFACTURER INFORMATION

## **SECTION 1 – INTRODUCTION**

### **PURPOSE**

The City of Clear Lake has been steadily working through upgrades and improvements to the water system including updates to the distribution system and elevated water storage. Recent distribution system improvements have added redundancy and reliability to the distribution system. Recent elevated water storage improvements have focused on eliminating the aged, high maintenance multi-legged water towers and replacing them with composite, low maintenance towers while maintaining 2.0 million gallon in elevated capacity to serve the City's needs for at least the next 50 years at the projected future water demands. These improvements have been based on the 2009 Veenstra & Kimm, Inc. Water Tower Analysis which modeled system capacity and storage requirements to the year 2060.

There has not been any recent analysis performed on the water treatment plant or individual components within the treatment plant. This study represents Phase 1 of the water treatment plant evaluation and analyzes the existing High Service Pumps.

### **SCOPE**

This report will provide a condition assessment of the existing high service pumps and related ancillary systems. Alternatives will be developed to compare improvement options but the focus will be on compliance with IDNR design guidelines.

### **PREFACE REGARDING OPINION OF PROBABLE CONSTRUCTION COST**

The Engineer, using his professional judgment, has developed stated Opinions of Probable Construct Cost in this study (Cost Estimate) based upon the current site conditions observed. Development of these opinions included consideration of design input level; however, the circumstances under which the work is expected to be undertaken, the cost and availability of materials, labor and services, probable bidder response and the economic conditions at the time of bid solicitation are beyond the control of the Engineer and will impact actual bid costs. All cost estimates included herein represent present day costs. No provisions have been made for inflation or deflation. Should this project be delayed, the cost estimates should be reviewed and if necessary, adjusted utilizing the Engineers News Record Construction Cost Index. Cost estimates are presented in Chapter 6 – Summary, Project Cost, and Recommendations.

## **SECTION 2 – EXISTING HIGH SERVICE PUMPS**

### **GENERAL BACKGROUND**

The original water plant was built in 1948 as a replacement to a previous treatment plant. It had an intake from the lake with chemical feed, filtration step, clear well, and two high service pumps that provided water flow and pressure for the system. The three original filters, clear well, and one pump are still in service.

In 1972 a major expansion of the plant was conducted. This expansion still meets today's capacity requirements and included a new lake intake, lake water pumps, aerator, solids contact clarifiers, chemical feed, three additional sand filters, new clear well, and one new high service pump which has been the "work horse" for the water treatment plant since that time. Much of the facility is no longer used with the change from the lake water to drilled wells for source water. Treatment for lake water is more complicated and requires additional chemical feed applications than treatment of groundwater.

In 1989 a high service pump was added to replace an older pump. Section 3 gives the specifics on the current high service pumps in use.

### **DESCRIPTION OF THE SYSTEM**

The water distribution system is a looped network of cast iron, ductile iron, and plastic water piping. Hydrants and valves are located throughout for fire protection and isolation of sections as needed. Storage is provided by existing and new water tanks but will eventually be served by two 1.0 MG newer composite tanks. The remaining smaller tanks are 250,000 gallons in size and will not be needed in the future.

### **OBSERVATIONS AND POTENTIAL ISSUES**

We have made two inspections of the water treatment plant facilities and interviewed staff to determine their observations and concerns regarding the high service pumps and operation of said pumps. The key observations and concerns are as follows:

1. The condition and age of the high service pumps is a concern. This is explained in Section 3 with a Condition Assessment. However, the concerns are summarized as follows:
  - There is not capacity for future demands.
  - There is limited backup capability.
  - The remaining equipment service life is also very limited.
2. Some failures of check valves and related problems with the pumps indicate new check valves are needed that are made for this type of service and surge relief should be provided to control potential hydraulic issues which may result in water hammer. These issues will be modeled as part of design but the effects can clearly be seen with leaks developing in the system, valve failures, and similar problems.

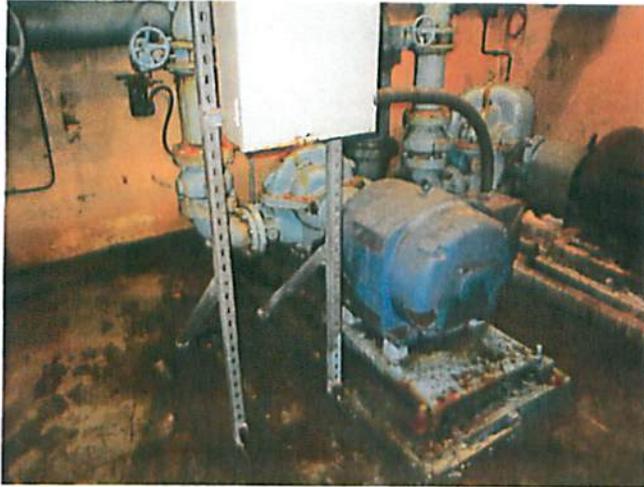
3. Pump controls and overall plant controls had some upgrades in 2000 with a new Motor Control Center (MCC) and Supervisory Panel by Automatic Control Systems. This included a Programmable Logic Controller (PLC) for plant control of operations. There are some needed instrumentation improvements for pump controls starting with a Variable Frequency Drive (VFD) to allow changes in pump speed and proper safety controls for the pumps.
4. Access for removal of existing piping and pumps is very difficult. Installation of new equipment will also be difficult as every component has to be hauled up or down multiple sets of stairs. A structural evaluation will be made to determine possible access that can be cut into the building structure to remedy this issue.

## SECTION 3 – CONDITION ASSESSMENT

### DESCRIPTION OF EQUIPMENT

In the two basement levels of the water plant are four existing high service pumps.

In the 1948 constructed basement and clear well are three pumps including High Service Pump No. 2 and No. 3. There is an additional pump that is out of service and is not operable. Refer to pictures below of the pumps.



HS Pump No. 2



HS Pump No. 3



Out of Service High Service Pump

In the 1972 building addition is High Service Pump No. 1 and three lake pumps that are out of service and not operable. High Service Pump No. 1 is connected to a separate clear well and is the "work horse" for the City. Refer to pictures below of HS Pump No. 1.



High Service Pump 1 - See Note 3



High Service Pump 1 - See Notes 1, 2, 3



High Service Pump 1 - See Note 4



Out of Service Lake Pumps

Notes for HS Pump No. 1:

1. Valmatic check valve Model 1810 has been replaced three times. Piping location on vertical pipe is an issue.
2. Garlock style reinforced rubber flex connector is for isolation from vibration. This can be damaged by hydraulic surges of 200 psi. Veenstra & Kimm, Inc. recommends this be replaced with a flanged hard coupling.
3. Pump is installed too close to the walls for proper access for maintenance purposes.
4. Window into clear well structure must be removed and opening filled.

Table 3-1 below is a summary of information known for the existing high service pumps.

**Table 3-1 High Service Pumps Summary**

<b>High Service Pump No. 1:</b>	Installed 1972
Motor:	Lincoln
Size:	100 HP, 1775 rpm
Service:	440V, 3 Ph.
Pump:	Fairbanks-Morse Model 5800
Size:	14-7/16" Impeller
Capacity per Pump Curve:	1530 gpm @ 190 FT TDH 1000 gpm @ 210 FT TDH
<b>High Service Pump No. 2:</b>	Installed 1989
Motor:	Marathon
Size:	100 HP, 1775 rpm
Service:	440V, 3 Ph.
Pump:	Aurora Model 89-14556
Size:	5x6x17, 1750 rpm
Capacity:	1500 gpm rated, 1300 gpm actual
<b>High Service Pump No. 3:</b>	Installed 1948
Motor:	Crocker-Wheeler
Size:	60 HP, 1750 rpm
Service:	440V, 3 Ph.
Pump:	Peerless
Size:	4" type TU-14
Capacity:	750 gpm

Table 3-2 following is a summary of the condition of the pumps and an assessment of remaining design life or continued use.

**Table 3-2 Condition Assessment Summary**

<u>Equipment Item</u>	<u>Year Installed</u>	<u>Current Condition</u>	<u>Remaining Life</u>	<u>Discussion of Limitations</u>
HS Pump No. 1	1972	Fair	1-2 years	Fairbanks-Morse pump per vendor comment has not had any factory parts replaced. This 5800 Series is no longer offered by F-M. A component failure such as impeller would be catastrophic.
HS Pump No. 2	1989	Fair	1-2 years	Aurora 410 Series is still in production and widely used. It is not pumping to rated capacity, probably due to wear on the impeller.
HS Pump No. 3	1948	Poor	1-2 years	This Peerless pump will be too small for the design flows required. It is used sparingly and is not expected to stay in service due to age and condition.

## SUMMARY

Reuse of the existing high service pumps for lead pumps is not recommended due to size or capacity, age, and service required for design conditions. The design conditions are explained in more detail in Section 4 and were modeled on future Peak Day Demand and the two new 1.0 MG composite water towers in service.

The existing motors are much lower in efficiency and power factor rating than today's motors. They are also standard duty motors that are not built for use with a variable frequency drive (VFD) control. The motors would fail in time if used on a VFD since they are not rated for inverter duty requirements that include changing torque, speed and load.

The existing Allen Bradley motor controls were installed in 2000 along with a new PLC control panel. These are reusable with the MCC suited for a constant speed pump which could be used for a backup pump utilizing an existing pump.



Motor Control Center (MCC)

The existing generator is a 1991 model and is only capable of manual operation. It is a 256 KVA 3 phase, 460 volt unit that in a load situation could only handle about 200 HP. It

could be used on a large well or a booster pump station but is undersized to handle the majority of the water plant load. This should be considered for future replacement.

The water treatment plant requires a properly sized generator and automatic transfer of load for power failure. A double wall fuel tank in the generator skid is required by IDNR standards with proper alarms and safety controls.

## SECTION 4 – HIGH SERVICE PUMP ALTERNATIVES

### GENERAL

High service pumps of this size / capacity (1000 – 2000 gpm) are usually split case or end suction type pumps. The goal is high pump efficiency (80-85%) with inverter duty motors suitable for variable speed service and a motor efficiency of 95% or greater. The pump alternatives will develop pump options but they must be a robust design suitable for the required service.

### IDNR REQUIREMENTS

Both IDNR and the Ten States Recommended Standards for Water Works – 2012 were reviewed for applicable standards. Part 6 for Pumping Facilities has some requirements that would need to be met including:

#### 6.2 General

6.2.1 Suction wells (reservoir) shall be watertight. The window into the 1972 existing clear well should be removed with opening plugged before it fails.

6.2.2 Equipment servicing requires:

- Crane, hoist, or related for servicing pumps
- Openings in floor or roof for removals of large items

6.2.5 Ventilation shall meet code requirements

6.2.6 Dehumidification is required to protect equipment

6.3 Pumps must meet maximum pumping demand with largest pump out of service. Pumps must meet peak demand against required system pressures without overloading.

6.6 Appurtenances include some additional requirements:

6.6.1 Valves for isolation are required. Surge relief or slow acting check valves are required to minimize hydraulic transients.

6.6.3 Gauges and meters are required to determine pump operation.

6.6.6 Standby power with fuel storage protection is required.

## DESIGN CRITERIA

The 2009 H2ONet Clear Lake Water Distribution System Model was re-run to determine pressures required at the new pumps located in the water treatment plant to provide flows and system pressure with the two new composite construction (1 mg) water towers in service. The pumps will input into the system to maintain tower level and satisfy demand were noted for worst case future conditions. The proposed design flows were determined as part of the 2009 Water Tower Analysis completed by Veenstra & Kimm, Inc. The pressure heads at the pump were measured and are presented in Table 4-1 Proposed Design Flows with High Service Pumps.

**Table 4-1 Proposed Design Flows with New High Service Pumps**

2060 Average Daily Demand:	1,500,000 gallons/day (1,042 gpm)
2060 Peak Day Demand:	2,300,000 gallons/day (1,597 gpm)

Proposed pumps are:	<u>Capacity</u>	<u>Total Discharge Head</u> (TDH)	<u>Motor Size</u> (HP)
Lead Pumps (2 new):	1,600 gpm	230 FT	125 or 150
Standby (Existing):	1,000 gpm	210 FT	100

VFD controls are proposed for the new lead pumps with the standby pump utilizing the existing motor control center (MCC).

## PUMP TYPES AND OPTIONS

High service applications are limited to pumps with the capability of pumping water with both the high head and high flow required and at a pump efficiency of 80-85%. This has been achieved by both split case style pumps and end suction pumps. The situation for the City of Clear Lake results flow range and pressure that are beyond the capacity of end suction pumps. The split case pumps must be specified with features to ensure a robust pump construction including:

- All cast iron pump construction
- Hardened 440C stainless steel shaft sleeves for packing
- 316 stainless steel shaft sleeves for mechanical seals
- Oil lubricated ball bearings
- Stainless steel shaft.

What can vary with different pump models is the speed of the pump (RPM). In some cases a 3600 RPM pump can be more efficient and lower horsepower than a 1750 RPM pump application. All of these conditions will be considered along with the drive controls.

Variable frequency drives (VFD) to change pump speed are recommended so that the pump will cycle on and off less frequently. The pump speed will be controlled by system pressure or water tower level signal that the pump is trying to match in order to satisfy demand and maintain a full tower. This will be monitored and adjusted by staff as needed. Turnover of the water in the elevated tanks can be controlled by staff adjusting set points.

Variable frequency drives (VFD) offer several benefits to the City as follows:

- Reduce energy used by matching demand and not over-pumping or cycling pumps.
- Motor starting current is greatly reduced and lowers the demand charge for power.
- High reliability.
- Helps to prevent water hammer, pipe stress, and pump issues such as cavitation.
- Controls both pressure and flow rate.

The development of alternatives for high service pumps became very limited in differences except for speed of the operating system. The analysis developed below notes differences in HP, efficiency point on pump curve and a comparison with advantages and disadvantages. There will not be a significant capital cost advantage but there can be long term savings in operating costs.

#### ALTERNATIVE NO. 1

Alternative No. 1 – 1800 RPM System Pump selections for a nominal 1800 RPM system were considered from several manufacturers as shown in Table 4-2 below. Pump curves and other information are included in Appendix B.

**Table 4-2 1800 RPM System Selections**

<u>Manufacturer</u>	<u>Model</u>	<u>Pump Speed</u>	<u>Capacity</u>	<u>TDH</u>	<u>HP</u>	<u>Eff.</u>	<u>Comments</u>
Aurora Pump	410 (5x6.17)	1775	1600 gpm	230	150	82%	
Weinman	6L1	1750	1600 gpm	230	150	79%	
Fairbanks Morse	1800 1STG	1775	1600 gpm	230	150	82%	
Fairbanks Morse	2800-HSC	1785	1600 gpm	230	150	75%	

**ALTERNATIVE NO. 2**

Alternative No. 2 – 3600 RPM System Pump selections for a nominal 3600 RPM system were considered from several pump manufacturers as shown in Table 4-3.

**Table 4-3 3600 RPM Pump Selections**

<u>Manufacturer</u>	<u>Model</u>	<u>Capacity</u>	<u>RPM</u>	<u>TDH</u>	<u>HP</u>	<u>Eff.</u>	<u>Comments</u>
Aurora Pump	410 (5x6x11C)	1600 gpm	3550	230	125	80%	Right of BEP
Weinman	No offer						
Fairbanks Morse	No offer						

Other requirements for the project are summarized in Table 4-4.

**Table 4-4 Summary of Additional Project Needs**

<u>Item</u>	<u>Description</u>	<u>Comments</u>
Reuse MCC	Standby pump and other existing equipment	
New VFD Controls	Control pump speed to meet demand	Lead, lag control by pressure switch
PLC Programming, I & C Work	Updates to existing ACS panel, systems integration with new equipment	Work by TTI
Demolition	Remove abandoned pumps, piping	Cut access hatch for permanent access
New Piping, Pumps	New pipe connections, valves, check valves, surge arrestor	Staff access for equipment service will be priority

## **SECTION 5 – ANALYSIS OF ALTERNATIVES AND RECOMMENDATIONS**

### **GENERAL**

New high service pumps and ancillary connections are required to comply with current design standards. The project will meet future flow and demand for system pressure into the year 2035 and beyond.

### **DISCUSSION**

The existing high service pumps have limited life left and need to be scheduled for replacement. Typical water treatment plant equipment has a design life expectancy of 20 years. Section 4 identified several design and code compliance issues that can be resolved with this project. The most important issues include having capacity to meet peak demand flows, reliable backup pumps, and standby power. The bidding of the project can include 2 – 3 pump manufacturers but as the alternative analysis developed, there should be a minimum pump efficiency requirement, maximum HP allowed, and specific pump design components. The VFD manufacturer should also be evaluated on the basis of long history of experience and service.

### **RECOMMENDED PROJECT**

The recommended project will include the following high service pumps:

- 2 units – 1600 gpm, 125 or 150 HP, minimum efficiency 82%
- 1 existing unit – 1000 gpm @ 210 ft TDH, 100 HP

Controls include new variable frequency drives (Allen Bradley, Cutler Hammer, Toshiba, or equal) with pump speed to match water tower level and/or pressure requirements. Local pressure switches at the pump will alarm and shut down in high pressure situation (pipe collapse, closed valve). Standby generator is recommended for power failures to maintain full system operation. However, the generator has not been included in the project costs presented in Section 6 as analysis of the generator was not included in the scope of services.

### **IMPLEMENTATION ISSUES**

The project will require a sequence of demolition and installation coordinated to keep the water treatment plant operational as follows:

1. Isolate 1948 clear well and pumps.
2. Cut in access openings for equipment removals and new units, piping, etc.
3. Remove existing pumps and cap off or valve piping to isolate.

4. Install one new pumps, piping, and connections:  
1600 gpm lead pump
5. Install new VFD controls and all connections and put 1948 clear well into service.
6. Isolate 1972 clear well and perform demolition work including removal of lake pumps to provide access for new pump and relocated existing pump. Remove window and properly fill opening in clear well.
7. Install new pump (1600 gpm), piping, valves, and ancillary connections.
8. Install relocated 1000 gpm pump with new connections.
9. Put 1972 clear well into service.
10. Finalize programming and related I & C work.

## SECTION 6 – SUMMARY, PROJECT COSTS, AND RECOMMENDATIONS

### SUMMARY

**This evaluation report finds the condition of the high service pumps to be beyond their normal service life.** New controls are needed to adjust pump speed to the demand and safety controls are needed for the equipment. There are several IDNR design guidelines that the water plant will become in compliance with after the project is implemented.

Construction will be a challenge to keep the water treatment plant in operation while new pumps are installed. This will require the contractor following a carefully designed sequence of construction activities. The completed project will provide reliable water system flows and pressure to the year 2035 and beyond.

### PROJECT COSTS

The project costs are summarized in Table 6-1 and itemized by construction divisions. The costs do reflect recent bidding activities. If the contractor has limited risk for the completion date and can work during winter weather, the project will be more attractive and could result in a better bidding response.

**Table 6-1 Cost Estimate – High Service Pump Installation**

<u>Division</u>	<u>Description</u>	<u>Cost</u>
Division 1 – General	Mobilization, bond, insurance, etc.	\$30,000
Division 2 – Sitework	None	\$0
Division 3 – Concrete	Pump bases, grout, restoration, replace opening in clear well	\$12,000
Division 4 – Masonry	None	\$0
Division 5 – Misc. Metals	Access hatches, demolition for saw cut openings	\$20,000
Division 6 – Wood, Plastics	None	\$0
Division 7 – Thermal, Moisture Protection	Caulking	\$1,000
Division 8 – Doors	Rollup door access at garage side, demolition	\$10,000
Division 9 – Coatings	Painting piping, valves, equipment and miscellaneous other items	\$7,500
Division 10 – Specialties	None	\$0
Division 11 – Equipment Installed	High service pumps (2)	\$70,000
Division 12 – Furnishings	None	\$0
Division 13 – Special Construction	Inside process piping, valves, fittings, demolition	\$50,000
Division 14 – Conveying	Hoist	\$10,000
Division 15 – Mechanical	Seal water, HVAC, humidity control (2 locations)	\$25,000

<u>Division</u>	<u>Description</u>	<u>Cost</u>
Division 16 – Electrical	VFD controls, wiring, connections	\$150,000
Division 17 – Instrumentation	Programming, systems integration, flow meters, control devices, miscellaneous	<u>\$50,000</u>
CONSTRUCTION SUBTOTAL		<b>\$435,500</b>
CONTINGENCIES (10%)		<u>\$44,000</u>
TOTAL ESTIMATED CONSTRUCTION		\$479,500
ENGINEERING – DESIGN & CONSTRUCTION MANAGEMENT (15%)		<u>\$72,000</u>
<b>TOTAL ESTIMATED PROJECT COST</b>		<b>\$551,500</b>

### RECOMMENDATIONS

Veenstra & Kimm, Inc. recommends the City approve the findings of this report and direct the design of the project to get underway in a timely manner.

The major components of the project are:

- New high service pumps  
    Lead Pumps (2 each) – 1600 gpm @ 230 ft TDH
- Variable speed drive controls for the pumps
- New safety controls for pump operations
- Localized climate / humidity control for pump protection

Veenstra & Kimm, Inc. would also like to note that there are many other components of the Water Treatment Plant that have not been included in this analysis. Veenstra & Kimm, Inc. recommends that the City perform a complete water treatment plant evaluation in the near future to determine if any other upgrades are necessary for this plant to serve the City into the future.

## SCHEDULE

The proposed schedule for improvements is as follows in Table 6-2.

**Table 6-2 Schedule for Improvements**

<u>Task</u>	<u>Proposed Date</u>
Submit High Service Pump Evaluation Report to IDNR for Approval	By September 20, 2013
Prepare Engineering Agreement	By September 27, 2013
Approve Engineering Agreement	October 7, 2013
Start Design of Project	October 14, 2013
60% Design Review Meeting with Owner	December 9, 2013
100% Plans and Specifications Submittal to IDNR and Owner	January 31, 2014
Construction Permit Application to IDNR	January 31, 2014
Bid Documents Completed	February 10, 2014
Project Advertised and Bid	April 15, 2014
Contract Award / Construction Start	May 15, 2014
Substantial Completion	March 31, 2015
Final Completion	May 31, 2015

**APPENDIX A**  
**MANUFACTURER INFORMATION**

Company: QFI  
 Name: Shawn  
 Date: 7/31/2013



Size: 6L1  
 Type: 1200-Horiz SplitCase  
 Synch speed: 1800 rpm  
 Curve: 6L1-182  
 Specific Speeds:  
 Dimensions: Suction: 8 in  
 Discharge: 6 in

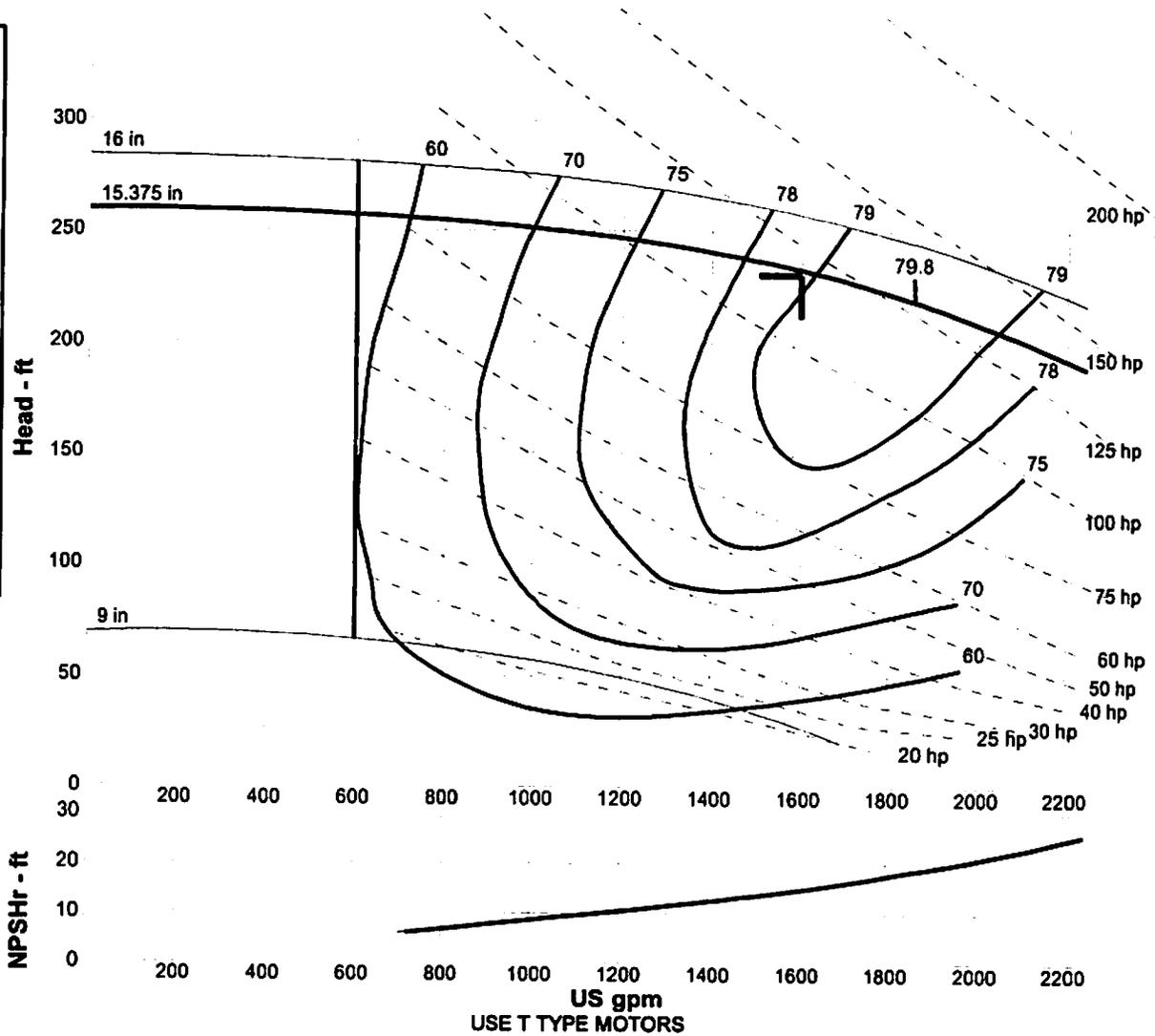
Flow: 1600 US gpm  
 Head: 230 ft

Water  
 SG: 1  
 Viscosity: 1.105 cP  
 NPSHa: --  
 Temperature: 60 °F  
 Vapor pressure: 0.2563 psi a  
 Atm pressure: 14.7 psi a

Temperature: 250 °F  
 Pressure: 175 psi g  
 Sphere size: 0.88 in  
 Power: ---  
 Eye area: ---

Standard: NEMA  
 Enclosure: TEFC  
 Sizing criteria: Max Power on Design Curve  
 Size: 150 hp  
 Speed: 1800  
 Frame: 445T

Flow:	1600 US gpm
Head:	232 ft
Eff:	79%
Power:	119 hp
NPSHr:	14.9 ft
Shutoff head:	260 ft
Shutoff dP:	112 psi
Min flow:	600 US gpm
BEP:	80% @ 1851 US gpm
NOL power:	140 hp @ 2242 US gpm
Max power:	157 hp @ 2242 US gpm



PERFORMANCE EVALUATION

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
1920	1750	214	79	130	19.7
1600	1750	232	79	119	14.9
1280	1750	244	76	104	11.4
960	1750	252	69	88.7	8.33
640	1750	256	57	73.6	5.27

# 6L1, 8L2A,B

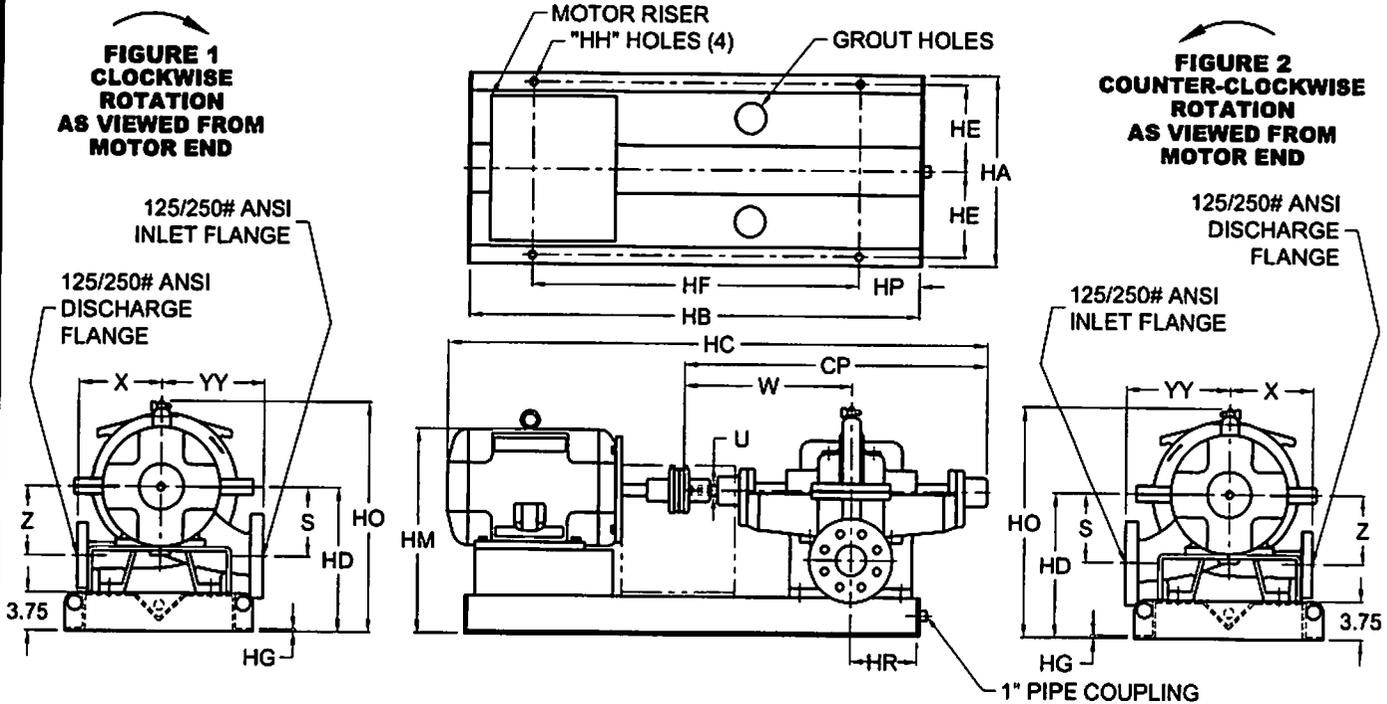
Double Suction  
Standard (Inches)



www.cranepumps.com

## Split Case Pumps - Horizontally Mounted

PUMP NO.	PUMP: TDH: GPM: ROTATION: FIGURE NO:	MOTOR: HP: RPM: PHASE: ENCLOSURE:	VOLTS: HZ: FRAME:
FOR:			
CERT. BY:	DATE:		



NOT FOR CONSTRUCTION, INSTALLATION OR APPLICATION PURPOSES UNLESS OTHERWISE CERTIFIED

**NOTES:**

1. ALL DIMENSIONS ±.13 EXCEPT WHERE NOTED.
2. ALL GAUGE TAPPINGS TO BE 1/4" N.P.T.
3. DIMENSIONS MAY VARY. HC & HM DIMENSIONS SHOWN BASED ON U.S. ELECTRIC STANDARD EFFICIENCY ODP MOTOR.
4. MOTOR MAY EXTEND OVER BASE.
5. DIMENSIONS SHOWN ARE FOR A STANDARD "DRIP TROUGH" BASE. CONSULT FACTORY FOR "DRIP PAN" BASE DIMENSIONS.

**DIMENSIONS IN INCHES**

PUMP	DISCH. (INCH)	INLET (INCH)	CP	HD	HO	S	U	W	X	YY	Z
6L1	6	8	36.88	18.50	32.25	9.25	1.56	20.25	16.00	17.00	8.75
8L2A,B	8	10	36.88	18.50	32.00	8.75	1.56	20.25	16.00	18.00	8.75

**DIMENSIONS IN INCHES**

MOTOR FRAME	HA	HB	HC	HE	HF	HG	HH	HM	HP	HR	MOTOR FRAME	HA	HB	HC	HE	HF	HG	HH	HM	HP	HR
254T	22.50	60.00	60.50	10.38	48.00	.38	.75	24.25	6.00	10.50	<del>364TS</del>	22.50	60.00	64.75	10.38	48.00	.38	.75	27.63	6.00	<del>10.50</del>
256T	22.50	60.00	61.00	10.38	48.00	.38	.75	24.25	6.00	10.50	365TS	22.50	60.00	65.75	10.38	48.00	.38	.75	<del>27.63</del>	6.00	10.50
284T	22.50	60.00	63.00	10.38	48.00	.38	.75	25.13	6.00	10.50	404T	28.50	68.00	<del>78.00</del>	13.38	56.00	.38	.75	29.00	6.00	10.50
286T	22.50	60.00	63.00	10.38	48.00	.38	.75	25.13	6.00	10.50	405T	28.50	68.00	71.50	13.38	56.00	.38	.75	29.00	6.00	10.50
284TS	22.50	60.00	62.00	10.38	48.00	.38	.75	25.13	6.00	10.50	404TS	22.50	60.00	67.25	10.38	48.00	.38	.75	29.00	6.00	10.50
286TS	22.50	60.00	62.00	10.38	48.00	.38	.75	25.13	6.00	10.50	405TS	<del>22.50</del>	60.00	68.75	10.38	48.00	.38	.75	29.00	6.00	10.50
324T	22.50	60.00	65.00	10.38	48.00	.38	.75	26.13	6.00	10.50	<del>444T</del>	28.50	68.00	75.75	13.38	56.00	.38	.75	29.50	6.00	<del>10.50</del>
326T	22.50	60.00	65.00	10.38	48.00	.38	.75	26.13	6.00	10.50	445T	28.50	68.00	77.75	13.38	56.00	.38	.75	29.50	6.00	10.50
324TS	22.50	60.00	64.00	10.38	48.00	.38	.75	26.13	6.00	10.50	<del>444TS</del>	28.50	68.00	72.00	13.38	56.00	.38	.75	30.60	6.00	10.50
326TS	22.50	60.00	64.00	10.38	48.00	.38	.75	26.13	6.00	10.50	<del>445TS</del>	28.50	68.00	74.00	13.38	56.00	.38	.75	29.50	6.00	10.50
364T	22.50	60.00	67.00	10.38	48.00	.38	.75	27.63	6.00	10.50											
365T	22.50	60.00	68.00	10.38	48.00	.38	.75	27.63	6.00	10.50											

SECTION 1200  
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DATE 1/13



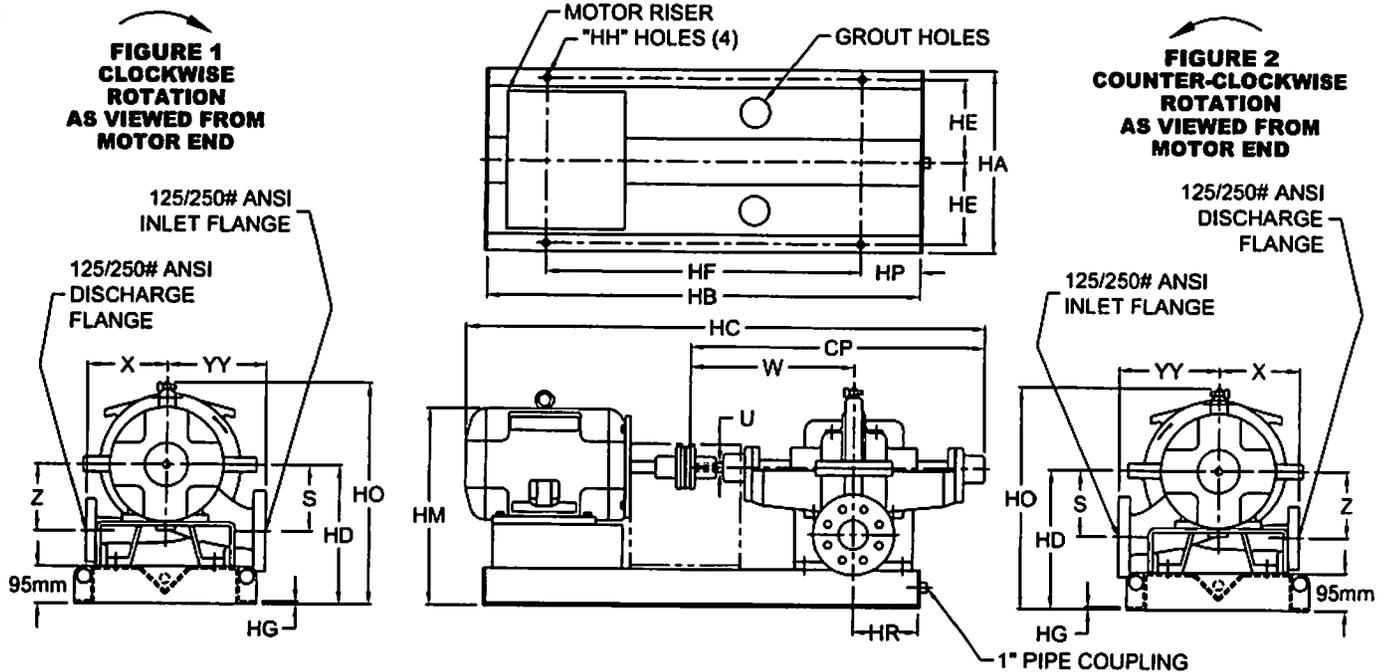
A Crane Co. Company

### PUMPS & SYSTEMS

USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

### Split Case Pumps - Horizontally Mounted

<b>PUMP NO.</b>	<b>PUMP:</b> TDH: GPM: ROTATION: FIGURE NO:	<b>MOTOR:</b> HP: RPM: PHASE: ENCLOSURE:	<b>VOLTS:</b>  <b>HZ:</b> <b>FRAME:</b>
<b>FOR:</b>			
<b>CERT. BY:</b>	<b>DATE:</b>		



**NOT FOR CONSTRUCTION, INSTALLATION OR APPLICATION PURPOSES UNLESS OTHERWISE CERTIFIED**

**NOTES:**

1. ALL DIMENSIONS ± 3mm EXCEPT WHERE NOTED.
2. ALL GAUGE TAPPINGS TO BE 1/4" N.P.T.
3. DIMENSIONS MAY VARY. HC & HM DIMENSIONS SHOWN BASED ON U.S. ELECTRIC STANDARD EFFICIENCY ODP MOTOR.
4. MOTOR MAY EXTEND OVER BASE.
5. DIMENSIONS SHOWN ARE FOR STANDARD "DRIP TROUGH" BASE. CONSULT FACTORY FOR "DRIP PAN" BASE DIMENSIONS.

**DIMENSIONS IN MILLIMETERS (Except where noted)**

PUMP	DISCH. (INCH)	INLET (INCH)	CP	HD	HO	S	U	W	X	YY	Z
6L1	6	8	937	470	819	235	40	514	406	432	222
8L2A,B	8	10	937	470	813	222	40	514	406	457	222

**DIMENSIONS IN MILLIMETERS (Except where noted)**

MOTOR FRAME	HA	HB	HC	HE	HF	HG	HH	HM	HP	HR	MOTOR FRAME	HA	HB	HC	HE	HF	HG	HH	HM	HP	HR
254T	572	1524	1537	264	1219	10	19	616	152	267	364TS	572	1524	1645	264	1219	10	19	702	152	267
256T	572	1524	1549	264	1219	10	19	616	152	267	365TS	572	1524	1670	264	1219	10	19	702	152	267
284T	572	1524	1600	264	1219	10	19	638	152	267	404T	572	1727	1778	340	1422	10	19	737	152	267
286T	572	1524	1600	264	1219	10	19	638	152	267	405T	572	1727	1816	340	1422	10	19	737	152	267
284TS	572	1524	1575	264	1219	10	19	638	152	267	404TS	572	1524	1708	264	1219	10	19	737	152	267
286TS	572	1524	1575	264	1219	10	19	638	152	267	405TS	572	1524	1746	264	1219	10	19	737	152	267
324T	572	1524	1651	264	1219	10	19	664	152	267	444T	724	1727	1924	340	1422	10	19	749	152	267
326T	572	1524	1651	264	1219	10	19	664	152	267	445T	724	1727	1975	340	1422	10	19	749	152	267
324TS	572	1524	1626	264	1219	10	19	664	152	267	444TS	724	1727	1829	340	1422	10	19	749	152	267
326TS	572	1524	1626	264	1219	10	19	664	152	267	445TS	724	1727	1880	340	1422	10	19	749	152	267
364T	572	1524	1702	264	1219	10	19	702	152	267											
365T	572	1524	1727	264	1219	10	19	702	152	267											

# 6L1, 8L2A,B

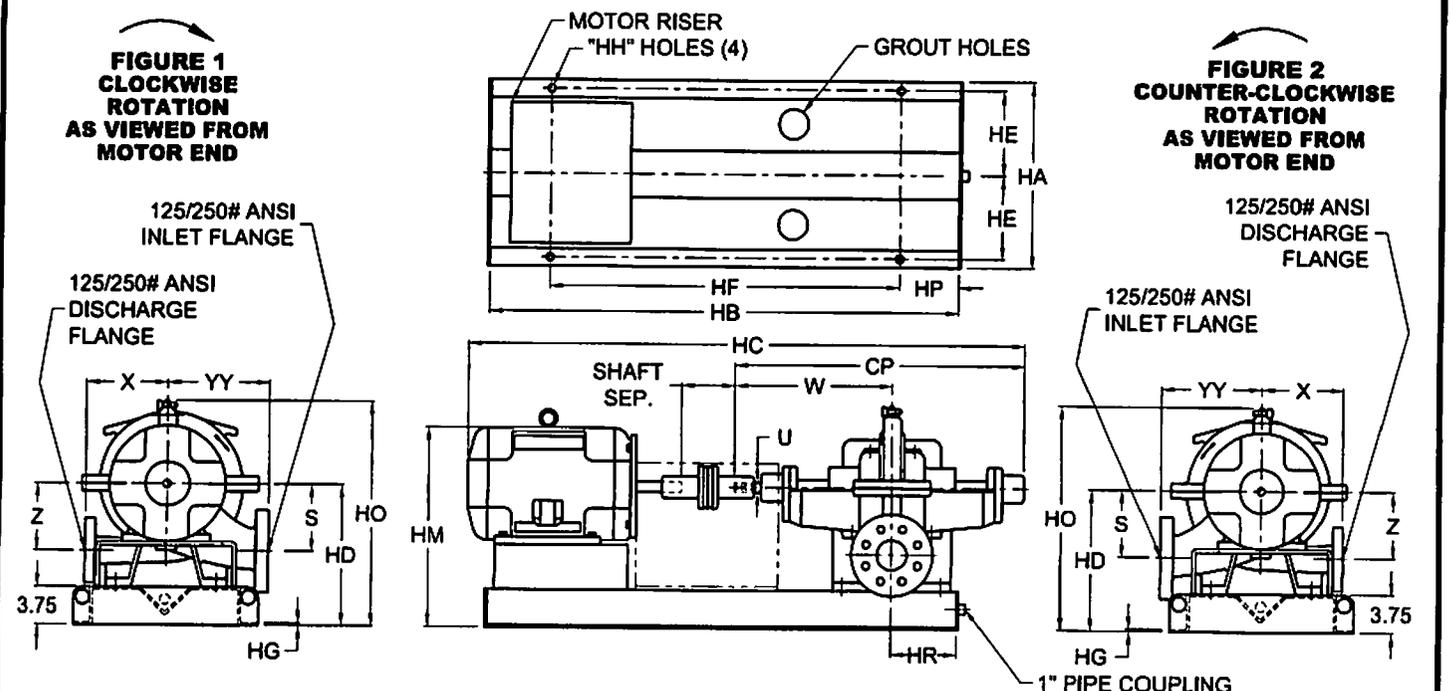
Double Suction - **Spacer Coupling**  
Standard (Inches)



www.cranepumps.com

## Split Case Pumps - Horizontally Mounted

PUMP NO.	PUMP: TDH: GPM: ROTATION: FIGURE NO:	MOTOR: HP: RPM: PHASE: ENCLOSURE:	VOLTS: HZ: FRAME:
FOR:			
CERT. BY:	DATE:		



**NOT FOR CONSTRUCTION, INSTALLATION OR APPLICATION PURPOSES UNLESS OTHERWISE CERTIFIED**

- NOTES:**
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  4. MOTOR MAY EXTEND OVER BASE.
  5. DIMENSIONS SHOWN ARE FOR STANDARD "DRIP TROUGH" BASE. CONSULT FACTORY FOR "DRIP PAN" BASE DIMENSIONS.

**DIMENSIONS IN INCHES**

PUMP	DISCH. (INCH)	INLET (INCH)	CP	HD	HO	S	U	W	X	YY	Z
6L1	6	8	36.88	18.50	32.25	9.25	1.56	20.25	16.00	17.00	8.75
8L2A,B	8	10	36.88	18.50	32.00	8.75	1.56	20.25	16.00	18.00	8.75

**DIMENSIONS IN INCHES**

MOTOR FRAME	HA	HB	HC	HE	HF	HG	HH	HM	HP	HR	SHAFT SEP	MOTOR FRAME	HA	HB	HC	HE	HF	HG	HH	HM	HP	HR	SHAFT SEP
254T	22.50	60.00	64.75	10.38	48.00	.38	.75	24.25	6.00	10.50	5.25	364TS	22.50	60.00	68.75	10.38	48.00	.38	.75	27.63	6.00	10.50	5.25
256T	22.50	60.00	65.50	10.38	48.00	.38	.75	24.25	6.00	10.50	5.25	365TS	22.50	60.00	69.75	10.38	48.00	.38	.75	27.63	6.00	10.50	5.25
284T	22.50	60.00	67.00	10.38	48.00	.38	.75	25.13	6.00	10.50	5.25	404T	28.50	68.00	74.75	10.38	48.00	.38	.75	29.00	6.00	10.50	5.25
286T	22.50	60.00	67.00	10.38	48.00	.38	.75	25.13	6.00	10.50	5.25	405T	28.50	68.00	76.25	10.38	48.00	.38	.75	29.00	6.00	10.50	5.25
284TS	22.50	60.00	65.75	10.38	48.00	.38	.75	25.13	6.00	10.50	5.25	404TS	28.50	68.00	71.75	13.38	56.00	.38	.75	29.00	6.00	10.50	5.25
286TS	22.50	60.00	65.75	10.38	48.00	.38	.75	25.13	6.00	10.50	5.25	405TS	28.50	68.00	73.25	13.38	56.00	.38	.75	29.00	6.00	10.50	5.25
324T	22.50	60.00	69.50	10.38	48.00	.38	.75	26.13	6.00	10.50	5.25	444T	28.50	72.00	80.00	13.38	60.00	.38	.75	29.50	6.00	10.50	5.25
326T	22.50	60.00	69.50	10.38	48.00	.38	.75	26.13	6.00	10.50	5.25	445T	28.50	72.00	82.00	13.38	60.00	.38	.75	29.50	6.00	10.50	5.25
324TS	22.50	60.00	68.00	10.38	48.00	.38	.75	26.13	6.00	10.50	5.25	444TS	28.50	68.00	86.25	13.38	56.00	.38	.75	29.50	6.00	10.50	5.25
326TS	22.50	60.00	68.00	10.38	48.00	.38	.75	26.13	6.00	10.50	5.25	445TS	28.50	68.00	78.25	13.38	56.00	.38	.75	29.50	6.00	10.50	5.25
364T	28.50	68.00	68.75	13.38	56.00	.38	.75	27.63	6.00	10.50	5.25												
365T	28.50	68.00	72.00	13.38	56.00	.38	.75	27.63	6.00	10.50	5.25												

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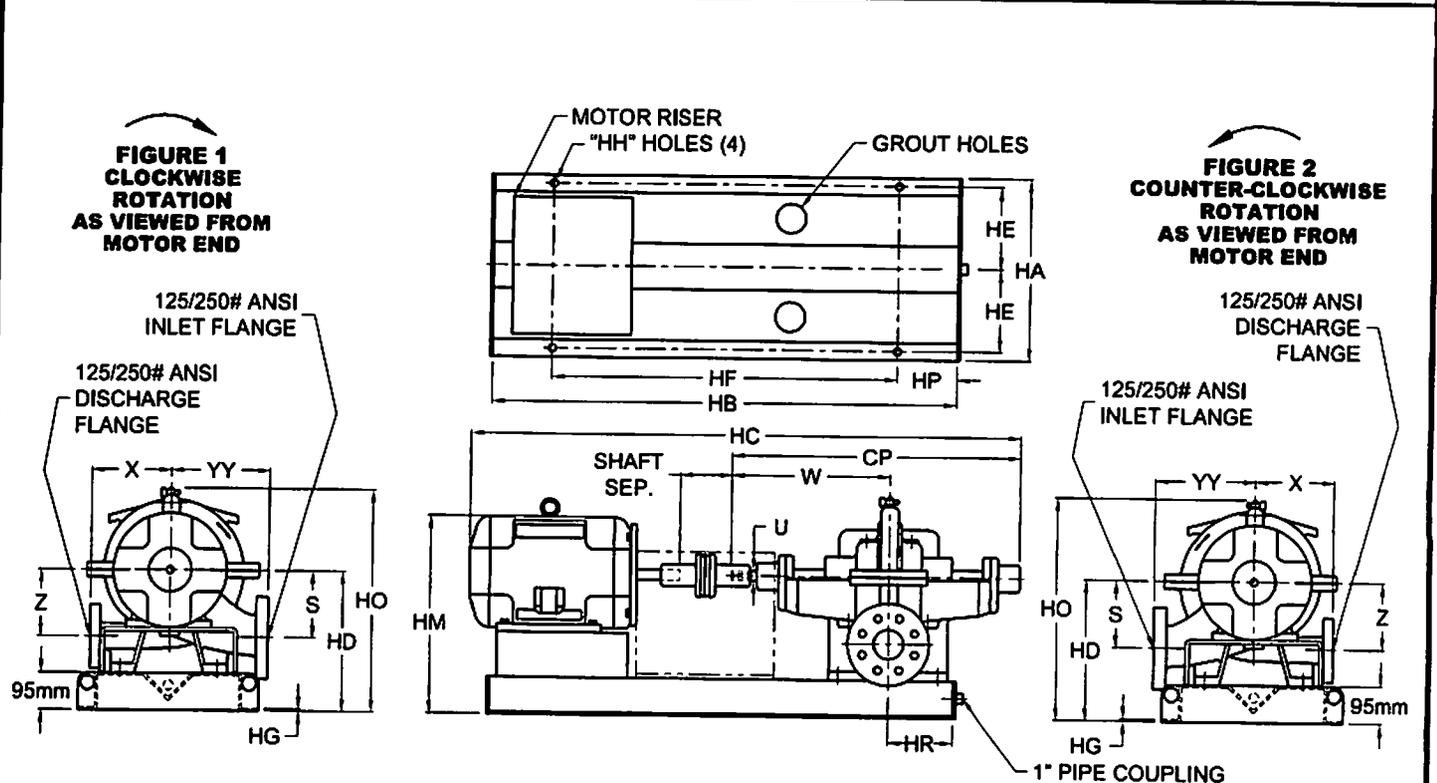
## PUMPS & SYSTEMS

A Crane Co. Company

USA: (937) 778-8947 • Canada: (905) 457-6223 • International: (937) 615-3598

### Split Case Pumps - Horizontally Mounted

<b>PUMP NO.</b>	<b>PUMP:</b>	<b>MOTOR:</b>	<b>VOLTS:</b>
<b>FOR:</b>	<b>TDH:</b>	<b>HP:</b>	<b>HZ:</b>
<b>CERT. BY:</b>	<b>GPM:</b>	<b>RPM:</b>	<b>FRAME:</b>
<b>DATE:</b>	<b>ROTATION:</b>	<b>PHASE:</b>	
	<b>FIGURE NO:</b>	<b>ENCLOSURE:</b>	



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**DIMENSIONS IN MILLIMETERS (Except where noted)**

PUMP	DISCH. (INCH)	INLET (INCH)	CP	HD	HO	S	U	W	X	YY	Z
6L1	6	8	937	470	819	235	40	514	406	432	222
8L2A,B	8	10	937	470	813	222	40	514	406	457	222

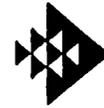
**DIMENSIONS IN MILLIMETERS (Except where noted)**

MOTOR FRAME	HA	HB	HC	HE	HF	HG	HH	HM	HP	HR	SHAFT SEP	MOTOR FRAME	HA	HB	HC	HE	HF	HG	HH	HM	HP	HR	SHAFT SEP
254T	572	1524	1645	264	1219	10	19	616	152	267	133	364TS	572	1524	1746	264	1219	10	19	702	152	267	133
256T	572	1524	1664	264	1219	10	19	616	152	267	133	365TS	572	1524	1772	264	1219	10	19	702	152	267	133
284T	572	1524	1702	264	1219	10	19	638	152	267	133	404T	724	1727	1899	264	1219	10	19	737	152	267	133
286T	572	1524	1702	264	1219	10	19	638	152	267	133	405T	724	1727	1937	264	1219	10	19	737	152	267	133
284TS	572	1524	1670	264	1219	10	19	638	152	267	133	404TS	724	1727	1822	340	1422	10	19	737	152	267	133
286TS	572	1524	1670	264	1219	10	19	638	152	267	133	405TS	724	1727	1861	340	1422	10	19	737	152	267	133
324T	572	1524	1765	264	1219	10	19	664	152	267	133	444T	724	1829	2032	340	1524	10	19	749	152	267	133
328T	572	1524	1765	264	1219	10	19	664	152	267	133	445T	724	1829	2083	340	1524	10	19	749	152	267	133
324TS	572	1524	1727	264	1219	10	19	664	152	267	133	444TS	724	1727	2191	340	1422	10	19	749	152	267	133
328TS	572	1524	1727	264	1219	10	19	664	152	267	133	445TS	724	1727	1988	340	1422	10	19	749	152	267	133
364T	724	1727	1746	340	1422	10	19	702	152	267	133												
365T	724	1727	1829	340	1422	10	19	702	152	267	133												

Company: Hutcheson Engineering Products, Inc.

Name: Trice Zaffino

Date: 8/1/2013



**AURORA**  
Pentair Water

Size: 5x6x11C

Type: 410 1 STG SPLIT CASE  
Synch speed: 3600 rpm

Speed: 3550 rpm  
Dia: 8.875 in

Curve: 2PC-125241A

Impeller: 444V184

Specific Speeds:

Ns: 1102  
Nss: 9889

Dimensions:

Suction: 6 in  
Discharge: 5 in

Flow: 1600 US gpm

Head: 230 ft

Water  
Density: 62.37 lb/ft<sup>3</sup>  
Viscosity: 1.105 cP

Temperature: 60 °F  
Vapor pressure: 0.2563 psi a  
Atm pressure: 14.7 psi a

NPSHa: ---

Standard: NEMA  
Enclosure: ODP

Size: 125 hp  
Speed: 3600  
Frame: 404T

Sizing criteria: Max Power on Design Curve

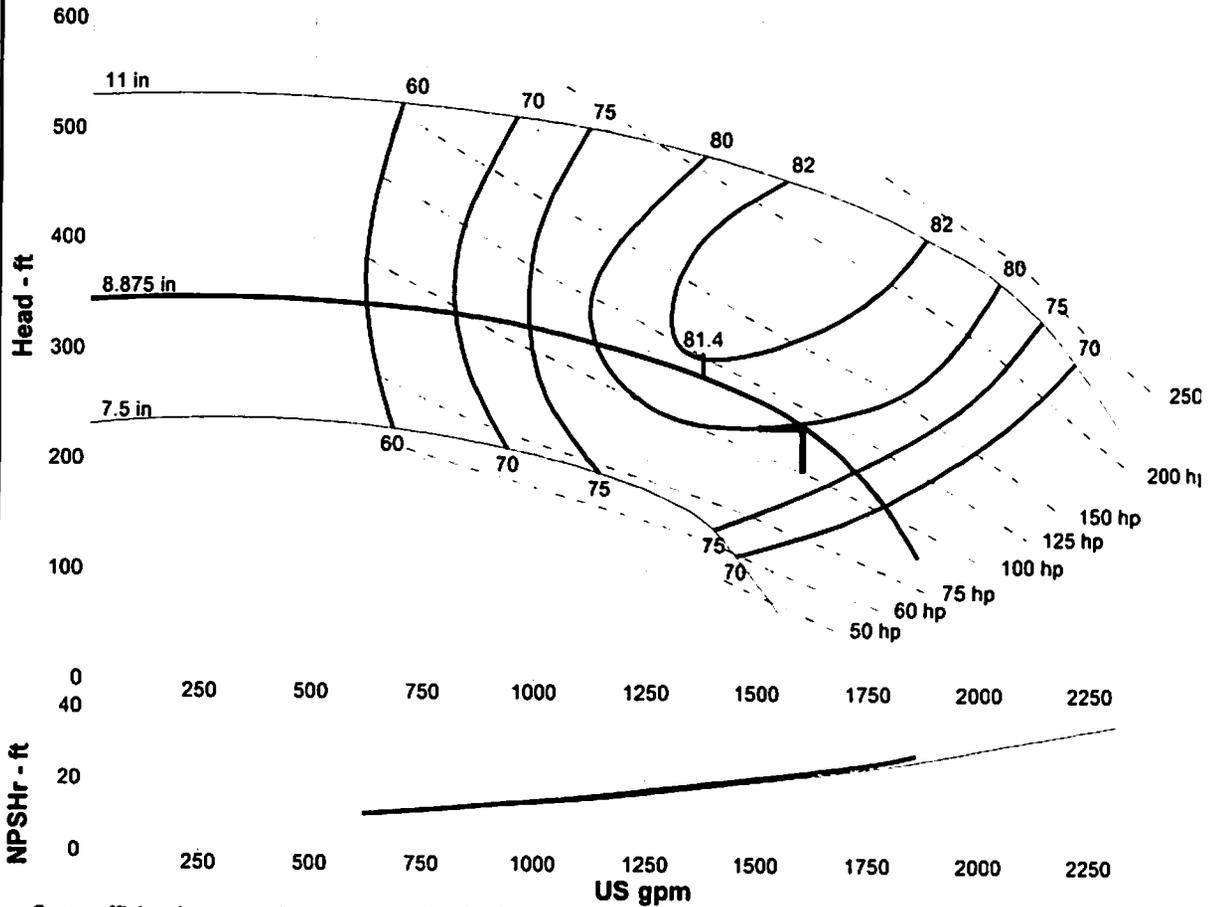
Temperature: 275 °F  
Pressure: 250 psi g  
Sphere size: 0.625 in

Power: ---  
Eye area: ---

Flow: 1600 US gpm  
Head: 231 ft  
Eff: 80%  
Power: 117 hp  
NPSHr: 22.2 ft

Shutoff head: 343 ft  
Shutoff dP: 149 psi  
Min flow: ---  
BEP: 81% @ 1374 US gpm  
NOL power: 118 hp @ 1374 US gpm

Max power: 236 hp @ 2131 US gpm



Curve efficiencies are typical. For guaranteed values, contact Aurora Pump or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Aurora Pump o a su distribuidor local.

Performance Evaluation

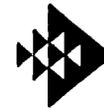
Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
1920	3550	---	---	---	---
1600	3550	231	80	117	22.2
1280	3550	288	81	115	17.4
960	3550	322	74	105	13.6
640	3550	339	61	89.7	10.6



Company: Huteson Engineering Products, Inc.

Name: Trice Zaffino

Date: 8/1/2013



**AURORA**  
Pentair Water

Size: 5x6x17

Type: 410 1 STG SPLIT CASE  
Synch speed: 1800 rpm

Curve: 2PC-144788A

Specific Speeds:

Dimensions:

Speed: 1775 rpm  
Dia: 15.625 in

Impeller: 444A329

Ns: 863

Nss: 5825

Suction: 6 in

Discharge: 5 in

Flow: 1600 US gpm

Head: 230 ft

Water

Density: 62.37 lb/ft<sup>3</sup>

Viscosity: 1.105 cP

NPSHa: ---

Temperature: 60 °F

Vapor pressure: 0.2563 psi a

Atm pressure: 14.7 psi a

Standard: NEMA

Enclosure: ODP

Sizing criteria: Max Power on Design Curve

Size: 150 hp

Speed: 1800

Frame: 444T

Temperature: 275 °F

Pressure: 250 psi g

Sphere size: 0.688 in

Power: ---

Eye area: ---

Flow: 1600 US gpm  
Head: 230 ft  
Eff: 82%  
Power: 114 hp  
NPSHr: 15.5 ft

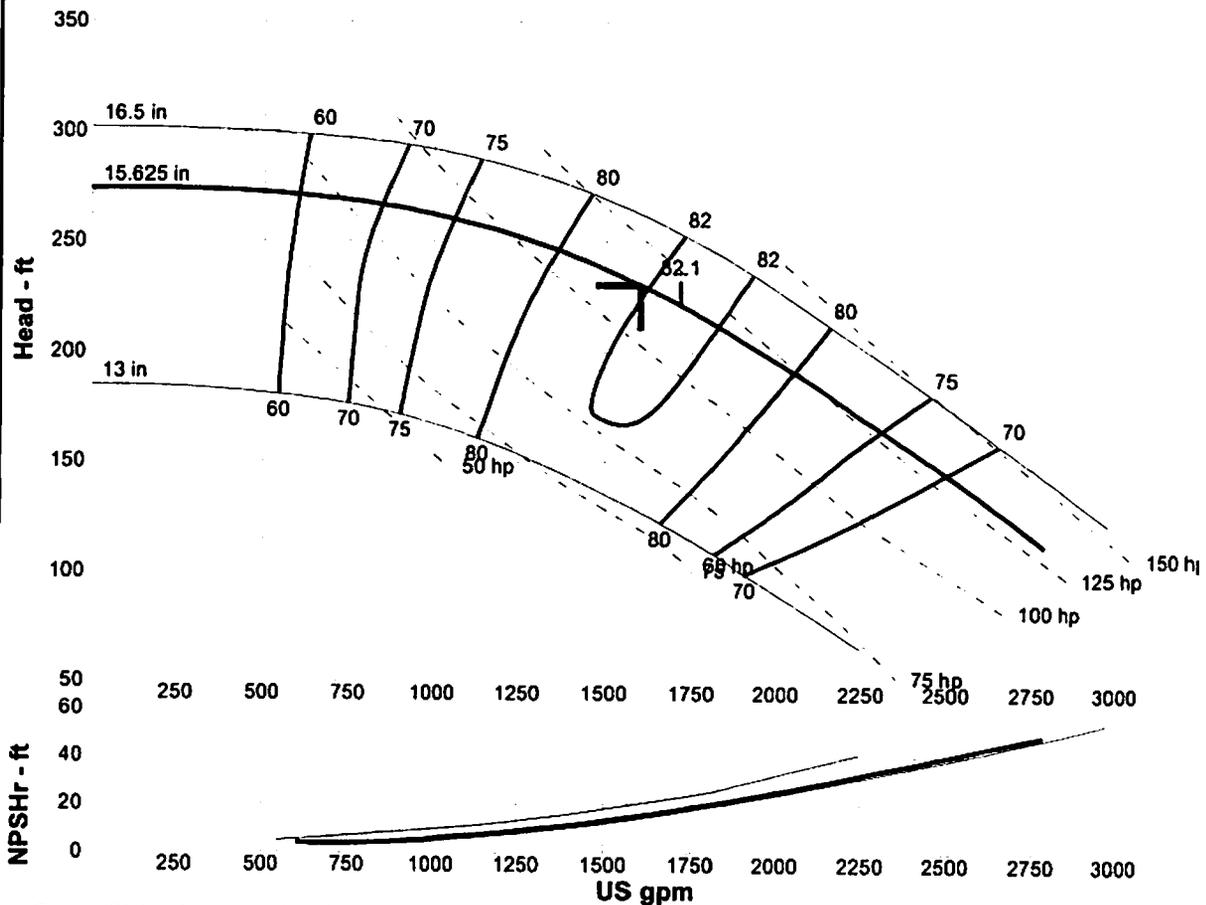
Shutoff head: 274 ft  
Shutoff dP: 119 psi

Min flow: ---

BEP: 82% @ 1714 US gpm

NOL power:  
130 hp @ 2495 US gpm

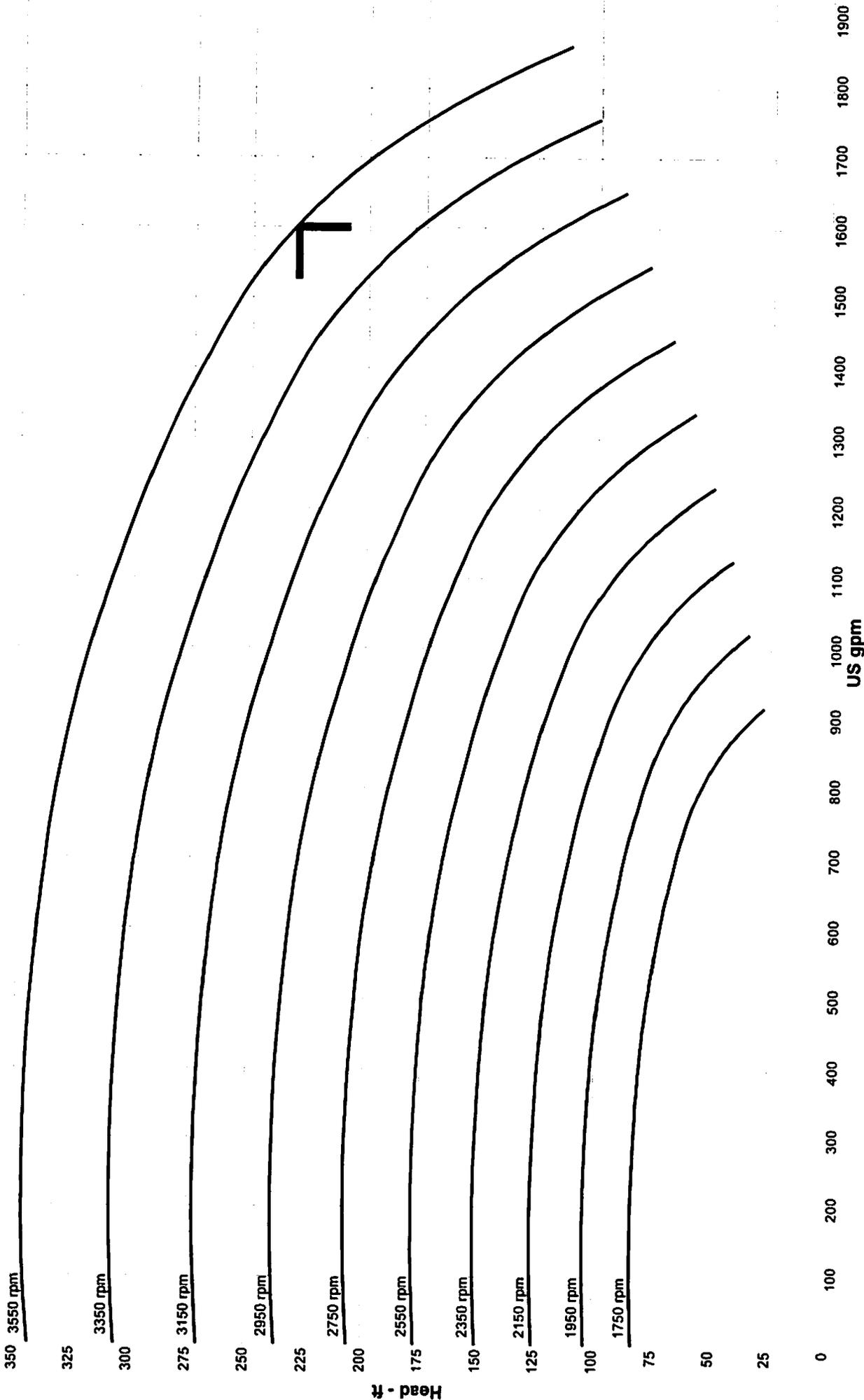
Max power:  
155 hp @ 2977 US gpm



Curve efficiencies are typical. For guaranteed values, contact Aurora Pump or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Aurora Pump o a su distribuidor local.

**Performance Evaluation:**

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
1920	1775	203	81	121	23.2
1600	1775	230	82	114	15.5
1280	1775	250	79	102	9.71
960	1775	263	73	87.7	5.58
640	1775	270	62	70.7	4.12



Curve efficiencies are typical. For guaranteed values, contact Aurora Pump or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Aurora Pump o a su distribuidor local.

Company: Hutcheson Engineering Products, Inc.      AURORA PUMPS  
 Name: Trice Zaffino      Catalog: Aurora Pumps 60 Hz, Vers 4.1  
 8/2/2013      410 1 STG SPLIT CASE - 3600

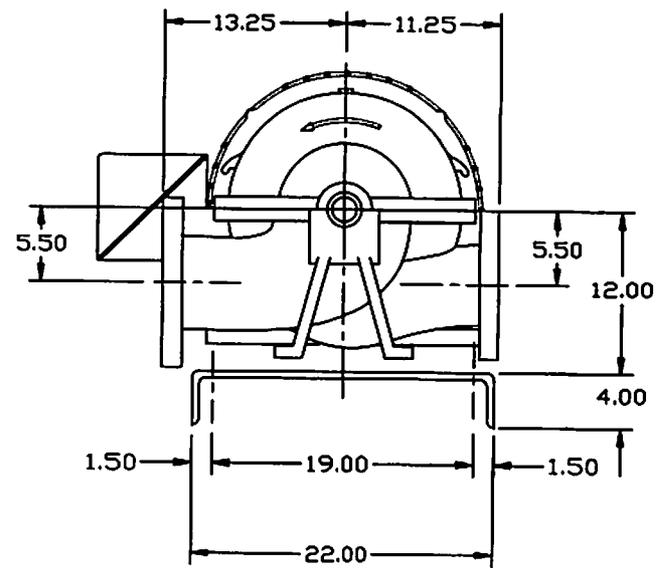
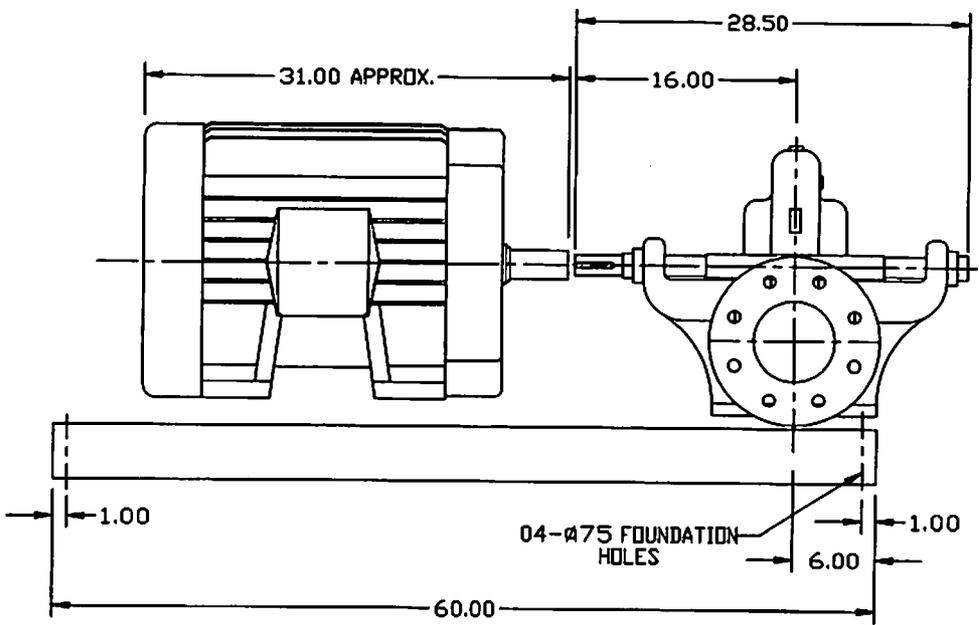
Size: 5x6x11C  
 Speed: 1750 - 3550 rpm  
 Dia: 8.875 in  
 Curve: 2PC-125241A  
 Impeller: 444V164



**AURORA®**  
Pentair Water

PART NUMBER  
400000000-0074678

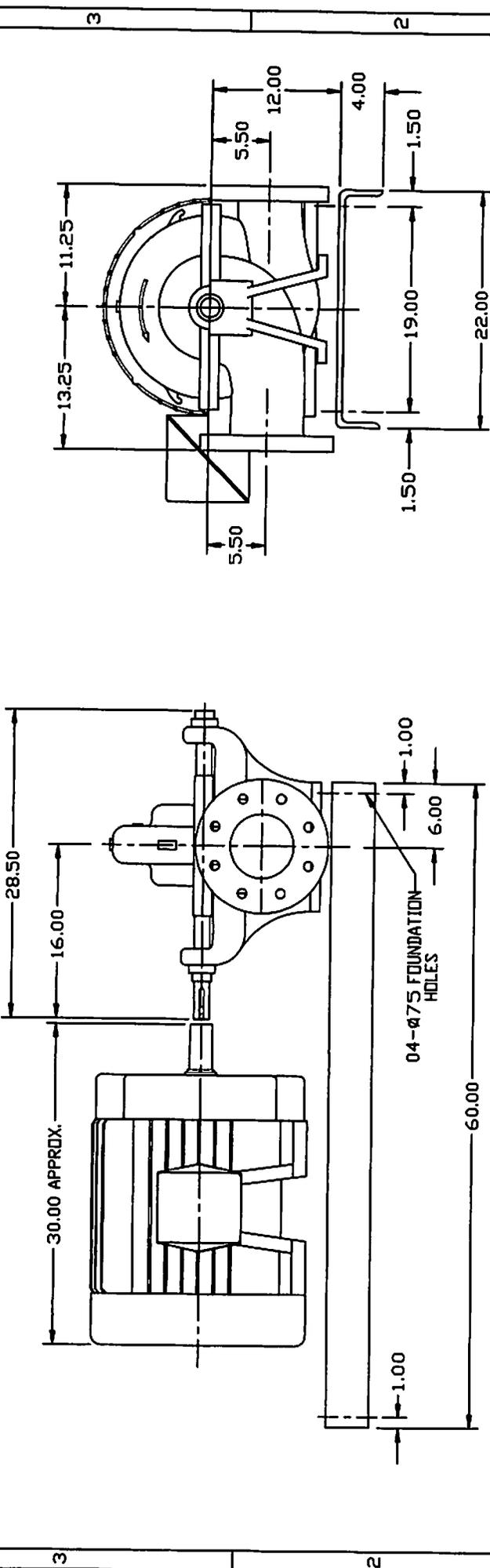
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	405TS_MOTOR	
2	1	411_536X11_RM_125-125	
3	1	FS_BASE_22X60X4	



NOTE :  
COUPLING GAP MAY VARY FROM .13 TO 2.06

MATERIAL:		<b>ap AURORA®</b>	
<small>COMPANY CONFIDENTIAL Information contained herein is confidential to the property of Aurora Energy Inc. No part of this drawing shall be reproduced or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of Aurora Energy Inc.</small>			
DO NOT SCALE DRAWING		411 ON FORMED STEEL BASE	
DESIGNED BY DS	DATE 06/23/03	DESIGNED BY JLF	APPROVED BY CSJ
PLOT SCALE 0.150	PATTERN NUMBER	SIZE C	PART NUMBER 400000000-0074678

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	40WTS_MOTOR	
2	1	411_5760011_RH_125-125	
3	1	FS_BASE_2256254	



NOTE :  
COUPLING GAP MAY VARY FROM .13 TO 2.06

		<b>411 ON FORMED STEEL BASE</b>	
DO NOT SCALE DRAWING	DATE: 06/23/03	DRAWN BY: J.L.F.	CHECKED BY: J.S.J.
PLOT SCALE: 0.150	PART NUMBER:	SIZE: C	REV:

ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN INCHES AND DECIMALS THEREOF.  
 DIMENSIONS TO CENTER UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO SURFACE UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE CENTER UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE SURFACE UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE EDGE UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE END UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE START UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE THROUGH UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE STOP UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE OPEN UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE CLOSED UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE OPENING UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE CLOSURE UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE OPENING SURFACE UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE CLOSURE SURFACE UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE OPENING SURFACE UNLESS OTHERWISE SPECIFIED.  
 DIMENSIONS TO HOLE CLOSURE SURFACE UNLESS OTHERWISE SPECIFIED.

Company: Veenstra & Kimm  
 Name: Mark Seip  
 Date: 8/2/2013

Clear Lake High Service Pumps - 2 units



**Pump:**

Size: 5" 1824, 1814 & 1844  
 Type: 1800 1STG SPLIT CASE  
 Synch speed: 1800 rpm  
 Curve: 2PC-144788A  
 Specific Speeds:  
 Dimensions:  
 Speed: 1775 rpm  
 Dia: 15.625 in  
 Impeller: 444A329  
 Ns: 863  
 Nss: 5825  
 Suction: 6 in  
 Discharge: 5 in

**Search Criteria:**

Flow: 1600 US gpm  
 Head: 230 ft

**Fluid:**

Water  
 Density: 62.32 lb/ft<sup>3</sup>  
 Viscosity: 0.9946 cP  
 NPSHa: ---  
 Temperature: 68 °F  
 Vapor pressure: 0.3391 psi a  
 Atm pressure: 14.7 psi a

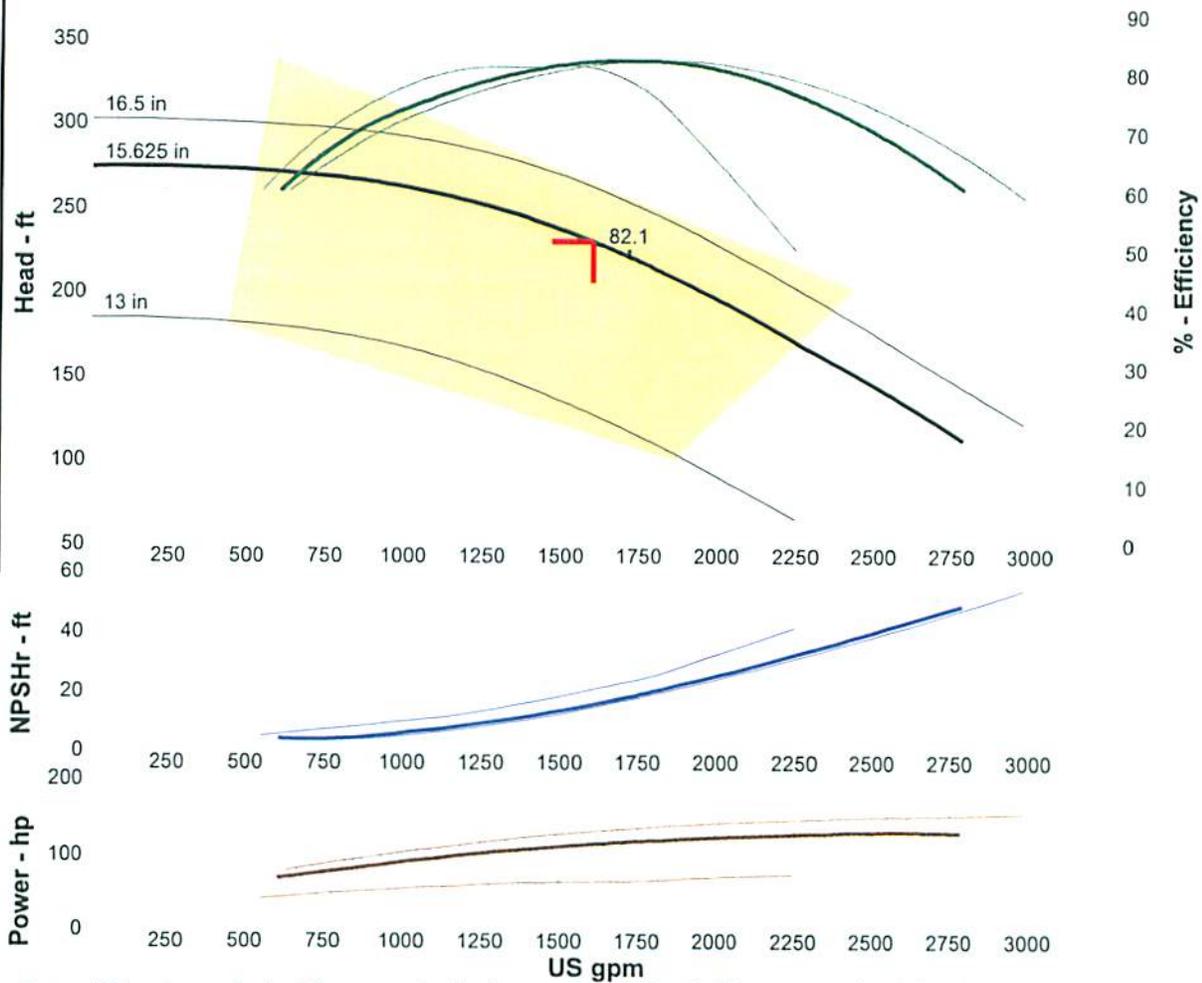
**Pump Limits:**

Temperature: 275 °F  
 Pressure: 250 psi g  
 Sphere size: 0.688 in  
 Power: ---  
 Eye area: ---

**Motor:**

Standard: NEMA  
 Enclosure: TEFC  
 Sizing criteria: Max Power on Design Curve  
 Size: 150 hp  
 Speed: 1800  
 Frame: 445T

--- Data Point ---	
Flow:	1600 US gpm
Head:	230 ft
Eff:	82%
Power:	113 hp
NPSHr:	15.5 ft
--- Design Curve ---	
Shutoff head:	274 ft
Shutoff dP:	119 psi
Min flow:	---
BEP:	82% @ 1714 US gpm
NOL power:	130 hp @ 2495 US gpm
-- Max Curve --	
Max power:	155 hp @ 2977 US gpm



Curve efficiencies are typical. For guaranteed values, contact Fairbanks Morse or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Fairbanks Morse o a su distribuidor local.

**Performance Evaluation:**

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
1920	1775	203	81	121	23.2
1600	1775	230	82	113	15.5
1280	1775	250	79	102	9.71
960	1775	263	73	87.5	5.58
640	1775	270	62	70.6	4.12

Company: Veenstra & Kimm  
 Name: Mark Seip  
 Date: 8/2/2013

Clear Lake High Service Pumps - 2 units



**Pump:**

Size: 5"2824A  
 Type: 2800-HSC  
 Synch speed: 1800 rpm  
 Curve: 240504A  
 Specific Speeds:  
 Dimensions:  
 Speed: 1785 rpm  
 Dia: 16.6875 in  
 Impeller: J5L1A1  
 Ns: 1005  
 Nss: 10265  
 Suction: 8 in  
 Discharge: 5 in

**Search Criteria:**

Flow: 1600 US gpm Head: 230 ft

**Fluid:**

Water  
 Density: 62.32 lb/ft<sup>3</sup>  
 Viscosity: 0.9946 cP  
 NPSHa: ---  
 Temperature: 68 °F  
 Vapor pressure: 0.3391 psi a  
 Atm pressure: 14.7 psi a

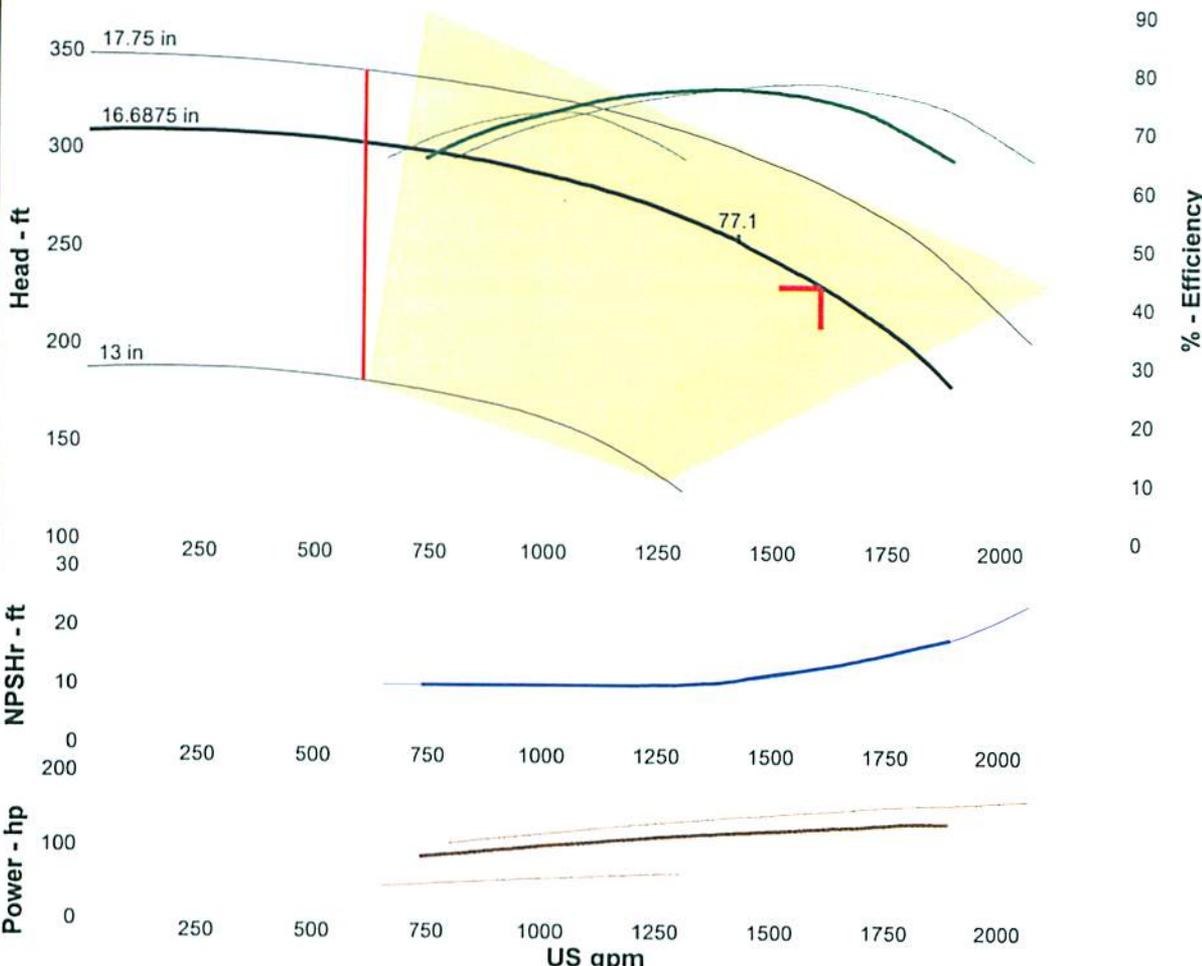
**Motor:**

Standard: NEMA  
 Enclosure: TEFC  
 Sizing criteria: Max Power on Design Curve  
 Size: 150 hp  
 Speed: 1800  
 Frame: 445T

**Pump Limits:**

Temperature: 160 °F  
 Pressure: 300 psi g  
 Sphere size: 0.63 in  
 Power: ---  
 Eye area: ---

---- Data Point ----	
Flow:	1600 US gpm
Head:	231 ft
Eff:	75%
Power:	124 hp
NPSHr:	13.1 ft
---- Design Curve ----	
Shutoff head:	309 ft
Shutoff dP:	134 psi
Min flow:	600 US gpm
BEP:	77% @ 1418 US gpm
NOL power:	132 hp @ 1890 US gpm
-- Max Curve --	
Max power:	162 hp @ 2064 US gpm



Curve efficiencies are typical. For guaranteed values, contact Fairbanks Morse or your local distributor. Las eficiencias en curvas son típicas. Para valores garantizados contacte a Fairbanks Morse o a su distribuidor local.

**Performance Evaluation:**

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
1920	1785	---	---	---	---
1600	1785	231	75	124	13.1
1280	1785	267	77	113	10.2
960	1785	289	72	97.4	10
640	1785	300	62	80.3	10

RESOLUTION NO. \_\_\_\_\_

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF CLEAR LAKE, IOWA, ACCEPTING THE OFFER OF DEDICATION FOR STREET RIGHT-OF-WAY AND EASEMENTS FOR PUBLIC USE AS SHOWN ON THE FINAL PLAT, ACCEPTING THE PUBLIC IMPROVEMENTS (WATER, SANITARY SEWER, STORM SEWER, AND STREETS WITH ALL RELATED IMPROVEMENTS) FOR MAINTENANCE, ACCEPTING THE SUBDIVISION MAINTENANCE BOND, AND RELEASING THE SUBDIVISION PERFORMANCE GUARANTEE FOR PINE BROOKE 3<sup>RD</sup> SUBDIVISION

WHEREAS, on April 24<sup>th</sup> and May 7<sup>th</sup>, 2012, the Planning & Zoning Commission and City Council, respectively, approved the Preliminary Plat for Pine Brooke 3<sup>rd</sup> Subdivision; and

WHEREAS, on February 12<sup>th</sup> and May 6<sup>th</sup>, 2013 the Planning & Zoning Commission and the City Council approved the Final Plat of Pine Brooke 3<sup>rd</sup> Subdivision; and

WHEREAS, the required public improvements, have now been completed in conformance with the approved Final Plat and any outstanding general punchlist items will be completed as mutually agreeable to the City and the Developer.

NOW, THEREFORE, BE IT RESOLVED, by the City Council of the City of Clear Lake that Pine Brooke 3<sup>rd</sup> Subdivision be accepted and all financial guarantees or security be released.

BE IT FURTHER RESOLVED, by the City Council of the City of Clear Lake that the public improvements (i.e., water mains, sanitary sewer mains, storm sewers, and streets with all related improvements) are hereby accepted for maintenance, and the offer of dedications for public use of all streets and parcels as offered for dedication on the Final Plat are hereby accepted.

BE IT FURTHER RESOLVED that the Maintenance Bond to guarantee against defects in material and workmanship for a period of two (2) years is hereby accepted.

PASSED AND APPROVED by the City Council of the City of Clear Lake, Iowa, this 3<sup>rd</sup> day of September, 2013.

\_\_\_\_\_  
Nelson P. Crabb, Mayor

Attest:

\_\_\_\_\_  
Jennifer Larsen, City Clerk

CERTIFICATE OF COMPLETION

Date Filed: August 14, 2013

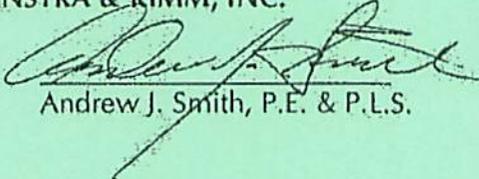
JOSHUA, INC.  
PINE BROOKE THIRD SUBDIVISION PROJECT  
CLEAR LAKE, IOWA

Work Substantially Completed: September 21, 2012

Veenstra & Kimm, Inc. hereby certifies that an on-site review of the completed construction of the Pine Brooke Third Subdivision Project as performed by Brian Nettleton Excavating, Inc. has been performed.

As engineers for the project, it is Veenstra & Kimm, Inc.'s opinion that the work performed is in substantial accordance with the plans, specifications, and that the final amount of the Contract is Two Hundred Fifty-Six Thousand Three Hundred Forty-Five and 81/100 Dollars (\$256,345.81). However, there is workmanship issues with the quality of the surface of the asphalt pavement. It was Veenstra & Kimm, Inc. recommendation that a price adjustment be levied relative to the asphalt pavement workmanship. However, it is understood that Joshua, Inc. does not wish to levy the recommended price adjustment. In addition, Lien Waivers have not yet been received from the Contractor.

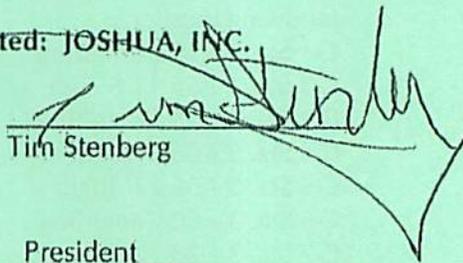
VEENSTRA & KIMM, INC.

By:   
Andrew J. Smith, P.E. & P.L.S.

Title: Project Engineer

Date: 8/14/13

Accepted: JOSHUA, INC.

By:   
Tim Stenberg

Title: President

Date: 8-27-13



## PUNCHLIST

### PINE BROOKE THIRD SUBDIVISION PROJECT CLEAR LAKE, IOWA

Contractor: Brian Nettleton Excavation

V&K Job No.: 4398

#### Status Legend

C= Complete

I= Incomplete

P = Pending

U= Underway

W= Wait Until Spring

Date Inspected: October 03, 2012

Date Updated: August 14, 2013

Prepared By: Andy Smith, P.E. & P.L.S.

Reviewed By: Andy Smith, P.E. & P.L.S.

<u>Item #</u>	<u>Item Description</u>	<u>Status</u>
1.	Remove and replace the northeast panel of concrete at the tie-in of the NE Quadrant of 10 <sup>th</sup> Ave. North and Nash Court.	C
2.	Blow out and re-saw if necessary all PCC joints and seal.	C
3.	Cut (with crack saw) and seal all random cracks unless they fall within 12"-15" of an existing sawcut.	C
4.	Construct PCC boxouts for sanitary sewer manholes. Furnish and install tapered adjusting ring to match street grade. Grout adjusting ring and casting. Set entire boxout and manhole frame ¼" below HMA surface.	C
5.	Remove and replace broken sidewalk panels on the north side of 10 <sup>th</sup> Ave. N. that were driven over for access to site on each side of Nash Court. Estimated to be 3 panels on each side.	C
6.	Repair surface imperfections in HMA surface course by removing imperfection and heating and refilling with HMA /sand mix at various locations as marked with pink paint and the surface tear in approximately the center of the cul-da-sac. Partially completed.	C
7.	Remove excess HMA overlapping curb & gutter section and dress up edge of HMA at the joint between HMA and curb & gutter section.	C
8.	Cut 7 cores as currently laid out. Cores are marked in green paint and are at the following locations: C-1 Sta. 1+50 Centerline C-2 Sta. 1+55 11.5' Left C-3 Sta. 2+25 Centerline C-4 Sta. 3+06 5' Right C-5 Sta. 3+06 22' Right C-6 Sta. 3+50 Centerline C-7 Sta. 3+28 22' Right	C
9.	Clean off manhole and intake lids/castings and remove HMA and other debris from pickholes.	C
10.	Install chimney seals (internal) on all sanitary sewer manholes. Re-adjust seals on sanitary manholes SSMH-1 and SSMH-3 as they are not installed onto cone section.	C
11.	Grout casting of Storm Sewer Intake INT-1. Partially completed, only 3 sides.	C
12.	Bolt down sanitary sewer manhole frame for MHSS-1 to cone section.	C
13.	Grout around the castings of storm sewer manholes MHST-1, MHST-2, MHST-3.	C
14.	Cut off lifting loops to all storm sewer manhole lids	C
15.	Cleanout all storm and sanitary sewer manholes and intakes	C
16.	Install drop in silt trap into intake INT-1	C
17.	Install silt fence around storm manholes MHST-1, MHST-2, MHST-3 and MHST-4	C

- Will likely need to be re-done as grading was not completed first nor grouting.
18. Grade around storm sewer manholes to allow drainage to each of the manholes. C
  19. Cut drainage swale in along Lot 4 & 5 lot line between storm intake INT-1 and storm manhole MHST-3. Mostly completed, some grading needed at back of curb. C
  20. Cut in shallow swale along east and west property lines of project site to allow drainage to north per plans. C
  21. Finish grade site and spread 3" of topsoil on entire site. C
  22. Dormant seed entire site once ground temperatures are at or below 46 degrees F. C
  23. Pull mandrel on sanitary sewer main. C
  24. Pull mandrel on storm sewer main. C
  25. Air test storm sewer C
  26. Video storm sewer and submit videos and reports to V&K C
  27. Submit remaining shop drawings per last Shop Drawing Transmittal letter dated 8/21/12 12/13/12. Handed out copy to Nettleton. C
  28. Submit all PCC testing results and certified plant reports. Have not submitted certified plant reports. C
  29. Submit all HMA testing results and certified plant reports. C
  30. At Contract closeout, submit Record Documents with transmittal letter containing date, Project title, CONTRACTOR'S name and address, list of documents, and signature of CONTRACTOR. C
  31. Remove and replace the ADA ramp on the west side of Nash Court as the southeast corner of the ramp has been driven over and broken off. C
  32. Re-vacuum test all sanitary manholes after grouting of the casting is completed. C
  33. Re-install silt fence along north property line C
  34. General site cleanup and debris pickup needed C

5/25/12

Performance, Payment and Maintenance Bond

Bond No.: IAC116632

**PERFORMANCE, PAYMENT AND MAINTENANCE BOND**

KNOW ALL MEN: That we, Brian Nettleton Excavating, Inc. of Joice, Iowa, hereinafter called the Principal, and

Merchants Bonding Company (Mutual),

hereinafter called the surety, are held and firmly bound unto Joshua, Inc., hereinafter called the Owner in the sum of Two Hundred Fifty Nine Thousand Eight Hundred Ninety One Dollars and 91/100 (\$259,891.91), for the payment whereof the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly, by these presents.

WHEREAS, the principal has, by means of a written Agreement dated June 29, 2012, entered into a Contract with the Owner for Pine Brooke Third Subdivision Project, which Agreement includes a guarantee of all work against defective workmanship and materials for a period of two (2) years from the date of Final Acceptance of the work by the Owner, a copy of which Agreement is by reference made a part hereof;

NOW, THEREFORE, the condition of this Obligation is such that, if the Principal shall faithfully perform the Contract on his part and shall fully indemnify and save harmless the Owner from all costs and damage which he may suffer by reason of failure so to do and shall fully reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any such default,

And Further, that if the Principal shall pay all persons who have contracts directly with the Principal for labor or materials, failing which such persons shall have a direct right of action against the Principal and Surety under this Obligation, subject to the Owner's priority,

Then this Obligation shall be null and void, otherwise it shall remain in full force and effect.

Provided, however, that no suit, action or proceeding by reason of any default whatever shall be brought on this Bond after three (3) years from the date of final acceptance of the work.

And Provided, that any alterations which may be made in the terms of the Contract, or in the work to be done under it, or the giving by the Owner of any extension of time for the performance of the Contract, or any other forbearance on the part of either the Owner or the Principal to the other shall not in any way release the Principal and the Surety, or either of them, their heirs, executors, administrators, successors or assigns from their liability hereunder, notice to the Surety of any such alteration, extension or forbearance being hereby waived.

And Further Provided, the Principal and Surety on this Bond hereby agree to pay all persons, firms, or corporations having contracts directly with the Principal or with subcontractors all just claims due them for labor performed or material furnished, in the performance of the Contract on account of which this Bond is given, when the same are not satisfied out of the portion of the contract price which the Owner shall retain until

5/25/12

Performance, Payment and Maintenance Bond

completion of the improvements, but the Principal and Surety shall not be liable to said persons, firms, or corporations unless the claims of said complaints against said portions of the contract price shall have been established as provided by law.

The Surety on this Bond shall be deemed and held, any contract to the contrary notwithstanding, to consent without notice:

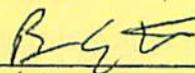
- a. To the extension of time to the Principal in which to perform the Contract.
- b. To changes in the plans, specifications, or Contract, when such changes do not involve an increase of more than twenty percent (20%) of the total contract price, and shall then be released only as to such excess increase.
- c. That no provision of this Bond or of any other contract shall be valid which limits to less than three (3) years from the date of final acceptance of the work the right to sue on this Bond for defects in workmanship or materials not discovered or known to the Owner at the time such work was accepted.

The Bond is executed in triplicate.

Signed and Sealed this 9th day of July, 2012.

PRINCIPAL:

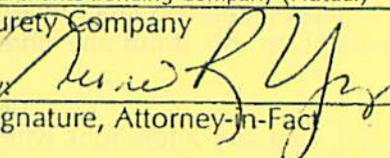
Brian Nettleton Excavating, Inc.  
Contractor

By:   
Signature

President  
Title

SURETY:

Merchants Bonding Company (Mutual)  
Surety Company

By:   
Signature, Attorney-in-Fact

Dione R. Young, Attorney-in-Fact & Iowa Resident Agent  
Name of Attorney-in-Fact

Ahrold Fay Rosenberg, Inc.  
Company Name

604 Locust Street, Suite 800  
Des Moines, Iowa 50309-3713  
Company Address (Including Zip Code)

515-309-6200  
Company Telephone Number

**CITY OF CLEAR LAKE, IOWA**

**LETTER OF CREDIT ISSUED ON BEHALF OF JOSHUA, INC.  
REGARDING PINE BROOKE THIRD SUBDIVISION, CLEAR LAKE, IOWA**

1. Background.

- A. Clear Lake Bank and Trust Company ("Bank") is informed that Joshua, Inc. ("Developer") has filed with the City of Clear Lake, Iowa ("City") a Plat of Pine Brooke Third Subdivision ("Subdivision") in accordance with the Clear Lake City Code.
- B. Bank understands the City Code and Resolutions of the City Council relating to approval of the Plat and Dedication for the Subdivision require certain improvements that may include but not be limited to the grading of lots, sanitary sewer, water main, storm sewer, streets and related appurtenances, street lights and fire hydrants, in accordance with applicable ordinances.
- C. Bank is located in Iowa and chartered under the laws of the United States and Iowa.
- D. Bank, at the request of Developer, has agreed to issue a Letter of Credit, irrevocable except as provided hereafter, in connection with the installation of improvements required in the Subdivision, as more specifically described in the document attached as Exhibit "A"

2. Terms of Letter of Credit.

- A. Bank hereby issues, in behalf of Developer, in favor of City, this Letter of Credit, irrevocable except as provided hereafter, in the amount of \$15,435.00.
- B. In the event Developer fails to complete the improvements detailed in Exhibit "A" within six months after final approval of the Plat for the Subdivision, then upon written notification by City to Bank, City may draw against this Letter of Credit in order to complete the improvements, except as provided hereafter.
- C. The amount of this Letter of Credit may be reduced in proportion to the value of the improvements completed during the six months immediately following final approval of the Plat for the subdivision, upon written certification of the Director of Public Works for City, which certification shall not be unreasonably withheld.
- D. In the event the improvements, detailed in Exhibit "A" are completed within the period of six months after final approval of the Plat for the Subdivision, this Letter of Credit shall be released and Bank and Developer fully exonerated.
- E. If Developer's failure to complete the improvements, detailed on Exhibit "A", within six months after final approval of the Plat for the Subdivision is due to no fault of Developer's own, because of fire, damage by the elements, unavoidable casualty, acts of God or delays or defaults caused by public carriers, suppliers or manufacturers which could not reasonably be foreseen or provided against by Developer or its contractors, City shall not draw on this Letter of Credit to complete the required improvements for an additional period of time to be determined by City.
- F. Notwithstanding any of the foregoing provisions, this Letter of Credit shall not be released and Developer and Bank shall not be exonerated unless:
  - i. there shall first have been provided to City a written demand for such release and exoneration; and
  - ii. 30 days shall have elapsed after service of the written notice of demand on City.

3. Notices. Notices required or permitted under this Letter of Credit shall be in writing and shall be effective when personally delivered or when sent to the last known address of a party by certified mail, return receipt requested. A failure to "receipt" shall constitute notice. In

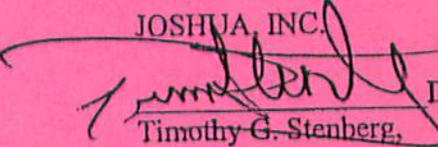
the case of City, the notice may be delivered to or sent by certified mail, return receipt requested to any of City's three agents identified below.

4. Captions. Captions are for convenience and shall not affect interpretation.
5. Governing Law. This Letter of Credit shall be governed by the laws of Iowa.

Approved and accepted by:

"DEVELOPER"

JOSHUA, INC.

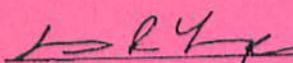
  
Timothy G. Stenberg,  
Operating Manager

Dated: 1-10-13

5024 S Bur Oak Place; Suite 113B  
Sioux Falls, IA 57108

"BANK"

CLEAR LAKE BANK & TRUST COMPANY

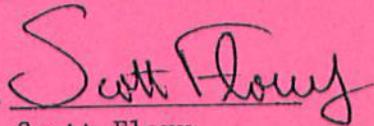
  
Marcus R. Younge,  
Vice President

Dated: 1-14-13

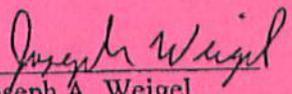
322 Main Avenue  
P.O. Box 8  
Clear Lake, IA 50428  
Telephone: 641-357-7121

Approved and Accepted by:

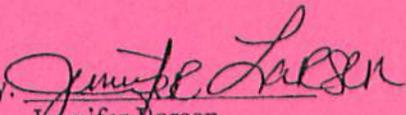
"CITY"

By:   
Scott Flory,  
City Administrator

1-14-13  
DATE

By:   
Joseph A. Weigel,  
Public Works Director

1-14-13  
DATE

By:   
Jennifer Larsen,  
City Clerk

1-14-13  
DATE

15 North 6<sup>th</sup> Street  
Clear lake, IA 50428

RESOLUTION No. 13-37

A RESOLUTION APPROVING THE FINAL PLAT FOR PINE BROOKE 3<sup>RD</sup> SUBDIVISION, ACCEPTING THE IMPROVEMENT SECURITY, AND AUTHORIZING THE MAYOR AND CLERK TO EXECUTE THE SAME

WHEREAS, on April 24, 2012, the Planning & Zoning Commission approved the preliminary plat for Pine Brooke 3<sup>rd</sup> Addition; and

WHEREAS, on May 7, 2012, the City Council approved the preliminary plat for Pine Brooke 3<sup>rd</sup> Addition; and

WHEREAS, on February 12, 2013, the Planning & Zoning Commission approved the Final Plat for Pine Brooke 3<sup>rd</sup> Addition; and

WHEREAS, the Developer has presented to the City and requested approval of the Final Plat prior to construction and completion of all the improvements; and

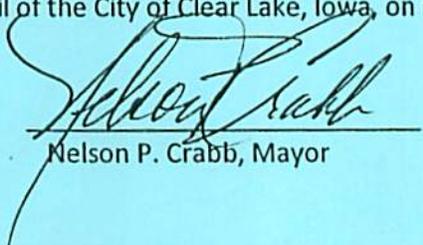
WHEREAS, the estimated value of the work to be completed is \$15,435 and the Developer has agreed to file with the City security in the form acceptable to the City in an amount equal to 110% of the costs set forth previously in this paragraph to guarantee faithful performance and completion of the remaining work items.

WHEREAS, the Developer shall file, with the City, a "Notice of Completion" of the Improvements specified herein within 6 months from the effective date of this Resolution, which shall certify that said work has been completed and request formal acceptance of the improvements by the City.

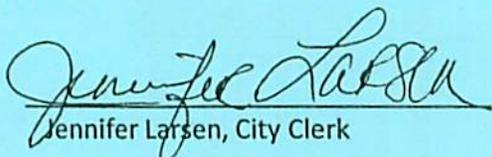
NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Clear Lake, Iowa does hereby approve the Final Plat for Pine Brooke 3<sup>rd</sup> Addition and that the offers of dedication shown thereon are hereby accepted, subject to the final acceptance of the improvements by Resolution of the City Council.

BE IT FUTHER RESOLVED that the subdivision improvement security is hereby accepted and that the Mayor and Clerk are hereby authorized to execute all such documents regarding the Final Plat and improvement security.

PASSED, APPROVED, AND ADOPTED by the City Council of the City of Clear Lake, Iowa, on May 6, 2013.

  
Nelson P. Crabb, Mayor

ATTEST:

  
Jennifer Larsen, City Clerk

# FINAL PLAT

## PINE BROOKE THIRD SUBDIVISION

### CLEAR LAKE, IOWA

**PROPERTY OWNER:**  
 JOSHUA, INC.  
 676 1st Street, President  
 5024 S. Bur Oak Place  
 Suite 1130  
 Clear Lake, IA 52708

**SUBDIVISION:**  
 Joshua, Inc.  
 676 1st Street, President  
 5024 S. Bur Oak Place  
 Suite 1130  
 Clear Lake, IA 52708

**SURVEY REQUESTED BY:**  
 Joshua, Inc.  
 676 1st Street, President  
 5024 S. Bur Oak Place  
 Suite 1130  
 Clear Lake, IA 52708

**SURVEYOR / ENGINEER:**  
 VEENSTRA & KIMM, P.C. & L.S.  
 2800 Fourth Street SW  
 Suite 9  
 Mason City, Iowa 50401

**DATE OF SURVEY:** September 2011 & February 2012

**ZONING:**  
 Current = RM-12  
 Proposed = RM-12

**Setbacks:** Setback 5' 1st Story,  
 3' additional per  
 additional story

Front Yard 25'  
 Rear Yard 20'  
 Corner Side Yard 25'  
 (Except Lot 1 is 20'  
 for this subdivision)

**APPROVED:**  
 CITY OF CLEAR LAKE, IOWA  
 CITY CLERK  
 DATE: May 9, 2013

**BY:** *Al Poyfard*  
 CHAIRMAN

**BY:** *Theresa M. Mayne*  
 SECRETARY

**APPROVED:**  
 CITY OF CLEAR LAKE, IOWA  
 CITY CLERK  
 DATE: May 9, 2013

**BY:** *Theresa M. Mayne*  
 SECRETARY

**LEGEND**

- ▲ FOUND SECTION CORNER MONUMENT (AS NOTED)
- SET 1/2" BEARS WITH YELLOW PLASTIC CAP #14233
- CALCULATED POSITION NO MONUMENT SET
- OTHER MONUMENT FOUND (AS NOTED)
- ( ) RECORD MEASUREMENT
- PROPERTY / LOT LINE
- STREET RIGHT-OF-WAY (ROW)
- STREET CENTERLINE
- EXISTING EASEMENT AREA AS SHOWN
- NEW EASEMENT AREA AS SHOWN
- LOT NUMBER
- SWFE SURFACE WATER FLOWAGE EASEMENT

**DESCRIPTION**  
 Outlot D in Pine Brooke First Subdivision, Clear Lake, Cerro Gordo County, Iowa, Containing 2.59 acres more or less. Subject to easements recorded or unrecorded.

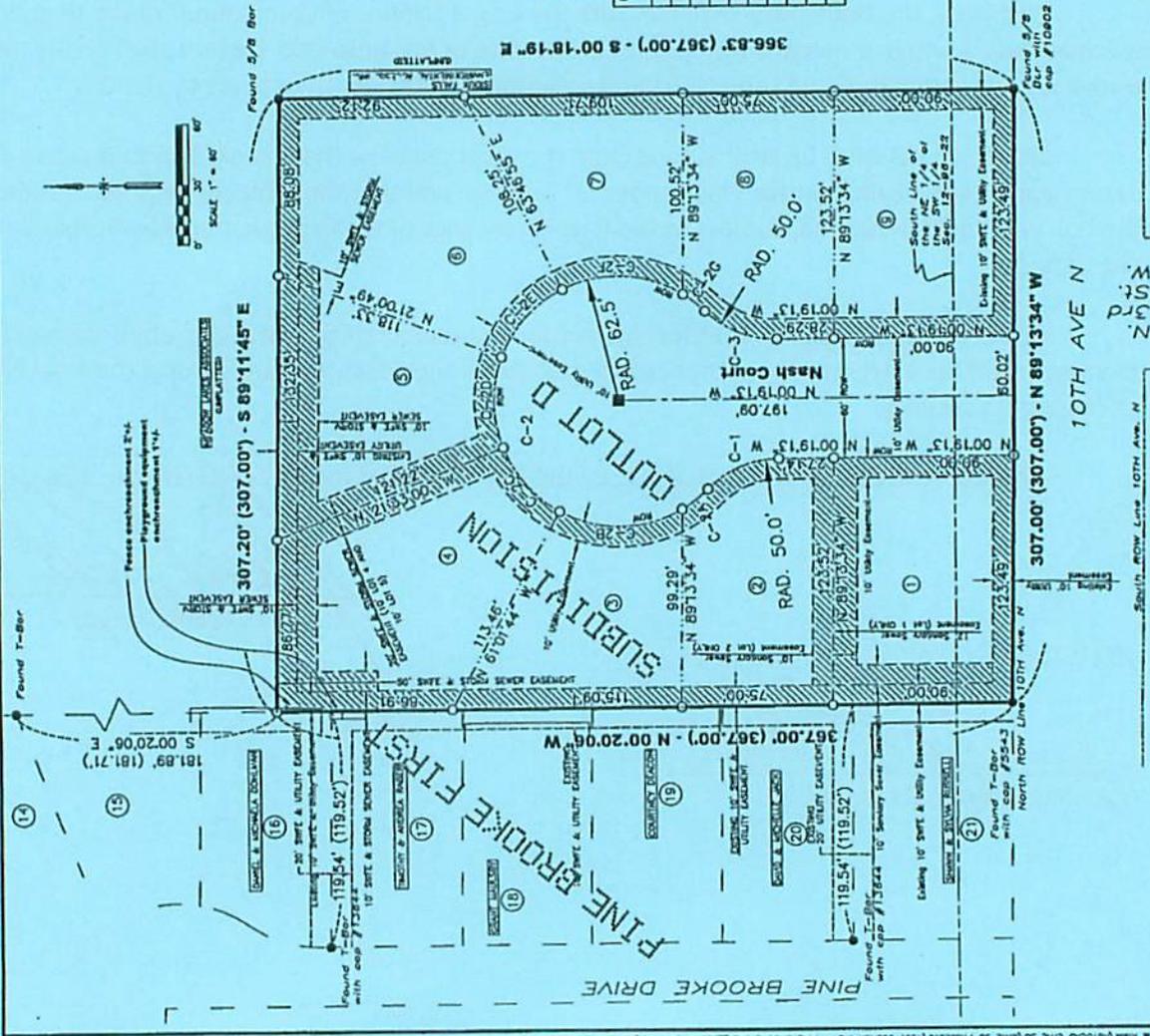
CURVE	ARC LENGTH (FEET)	RADIUS (FEET)	DELTA	CHORD BEARING	CHORD (FEET)	TANGENT (FEET)
C-1	39.26	50.0	44°59'12"	N 22°30'01" W	38.26	20.71
C-2	293.81	62.5	269°20'57"	N 89°40'47" E	88.89	N/A
C-2A	16.24	62.5	14°53'07"	N 37°33'08" W	16.19	8.16
C-2B	64.27	62.5	58°55'19"	N 00°38'55" W	61.48	35.30
C-2C	42.93	62.5	39°21'07"	N 48°29'18" E	42.09	22.35
C-2D	46.44	62.5	42°34'23"	N 89°27'03" E	45.38	24.35
C-2E	46.82	62.5	42°58'28"	S 47°48'01" E	45.74	24.57
C-2F	63.26	62.5	57°59'43"	S 02°39'34" W	60.60	34.64
C-2G	13.85	62.5	12°41'51"	S 38°00'21" W	13.82	6.95
C-3	39.26	50.0	44°59'12"	S 21°51'36" W	38.26	20.71

LOT	AREA (SQ FT)
1	11,113
2	8,856
3	8,409
4	12,687
5	9,786
6	13,097
7	8,064
8	8,893
9	11,113
STREETS	20,640
TOTAL	112,658



I hereby certify that this final plat and map document was prepared and the related survey work was performed by me or under my direct personal supervision and that I am a duly licensed Land Surveyor under the laws of the State of Iowa. My commission expires on 12/31/2013. My license number is 14233. My license renewal date is 12/31/2013.

*Andrew J. Smith*  
 Date: 9/18/12  
 My license renewal date is 12/31/2013.  
 Pages or sheets covered by this work: FP.01



**REVISIONS**

DATE	BY	REVISIONS

**VERIFY SCALE**

SCALE	AS SHOWN	AS NOTED
AS SHOWN	AS SHOWN	AS NOTED

**VEENSTRA & KIMM, INC.**  
 2800 Fourth Street SW, Suite 9, Mason City, Iowa 50401  
 562-21-8008 • 562-21-8009 • 562-21-8010

**PINE BROOKE THIRD SUBDIVISION**  
 JOSHUA, INC.

**FINAL PLAT**

PROJECT: FP.01

**ENGINEER'S OPINION OF PROBABLE COST  
14TH AVENUE S. PUBLIC ACCESS IMPROVEMENTS  
CLEAR LAKE, IOWA  
12066-13**

8/29/13

**ALTERNATE A - PCC PAVING**

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL AMOUNT</u>
1	Excavation, Cl. 10	60	CY	\$10.00	\$600.00
2	PCC Pavement, 6", Cl. C	170	SY	\$34.00	\$5,780.00
3	PCC Driveway, 6"	8	SY	\$40.00	\$320.00
4	Remove Pavement	8	SY	\$50.00	\$400.00
5	Storm Sewer Intake, Type M-A	1	EA	\$3,000.00	\$3,000.00
6	Storm Sewer, HDPE, 10"	87	LF	\$35.00	\$3,045.00
7	Storm Sewer Cleanout, 10"	1	EA	\$600.00	\$600.00
8	Connect to Existing Storm Intake	1	EA	\$750.00	\$750.00
9	Longitudinal Subdrain, 4"	61	LF	\$15.00	\$915.00
10	Subdrain Cleanout, 4"	2	EA	\$250.00	\$500.00
11	Subdrain Outlet	1	EA	\$300.00	\$300.00
12	Topsoil, Furnish and Place	85	TON	\$20.00	\$1,700.00
13	Sodding	33	SQ	\$60.00	\$1,980.00
14	Traffic Control	1	LS	\$500.00	\$500.00
15	Mobilization	1	LS	\$1,500.00	\$1,500.00
<b>TOTAL PROJECT</b>					<b>\$21,890.00</b>

**ENGINEER'S OPINION OF PROBABLE COST  
14TH AVENUE S. PUBLIC ACCESS IMPROVEMENTS  
CLEAR LAKE, IOWA  
12066-13**

8/29/13

**ALTERNATE B - HMA PAVING**

<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>QUANTITY</b>	<b>UNIT</b>	<b>UNIT PRICE</b>	<b>TOTAL AMOUNT</b>
1	Excavation, Cl. 10	105	CY	\$10.00	\$1,050.00
2	HMA Base, 3"	170	SY	\$14.00	\$2,380.00
3	HMA Base, 2"	170	SY	\$10.00	\$1,700.00
4	Modified Subbase	65	TON	\$17.00	\$1,105.00
5	PCC Driveway, 6"	8	SY	\$40.00	\$320.00
6	Remove Pavement	8	SY	\$50.00	\$400.00
7	Storm Sewer Intake, Type M-A	1	EA	\$3,000.00	\$3,000.00
8	Storm Sewer, HDPE, 10"	87	LF	\$35.00	\$3,045.00
9	Storm Sewer Cleanout, 10"	1	EA	\$600.00	\$600.00
10	Connect to Existing Storm Intake	1	EA	\$750.00	\$750.00
11	Longitudinal Subdrain, 4"	61	LF	\$15.00	\$915.00
12	Subdrain Cleanout, 4"	2	EA	\$250.00	\$500.00
13	Subdrain Outlet	1	EA	\$300.00	\$300.00
14	Topsoil, Furnish and Place	85	TON	\$20.00	\$1,700.00
15	Sodding	33	SQ	\$60.00	\$1,980.00
16	Traffic Control	1	LS	\$500.00	\$500.00
17	Mobilization	1	LS	\$1,500.00	\$1,500.00
<b>TOTAL PROJECT</b>					<b>\$18,315.00</b>



ENGINEERING  
 SURVEYING • LANDSCAPE ARCHITECTURE  
 1000 WEST 14TH AVENUE  
 CLEAR LAKE, IOWA 50505  
 PHONE: 563-385-2222  
 FAX: 563-385-2223  
 WWW.YAGGYCOLBY.COM

14TH AVENUE S PUBLIC ACCESS  
 IMPROVEMENT PROJECT  
 CLEAR LAKE, IOWA  
 TITLE SHEET

PROJECT NUMBER	14006
DATE	11/11/2010
DESIGNER	JACOBSON
CHECKER	JACOBSON
DATE	11/11/2010
SCALE	N/A
DATE	11/11/2010
SCALE	N/A

SHEET NUMBER  
**C1**  
 TOTAL SHEETS  
 1

# 14TH AVENUE S PUBLIC ACCESS IMPROVEMENT PROJECT CLEAR LAKE, IOWA

**SHEET INDEX**

C1	TITLE SHEET
C2	GENERAL INFORMATION
B.01	TYPICAL SECTIONS AND STANDARD DETAILS
D.01	14TH AVE. S PAVING PLAN

**CITY OFFICIALS**

MAYOR:  
 NELSON P. CRAEB  
 JIM BOEHMKE  
 DIANA BRANT  
 MIKE CALLANAN  
 TONY NELSON  
 TERRY UNSWORTH

CITY COUNCIL:  
 PUBLIC WORKS DIRECTOR:  
 JOE WEGCEL  
 CITY ADMINISTRATOR:  
 SCOTT FLORY

**VERTICAL CONTROL**

VERTICAL CONTROL IS BASED ON THE NAVD 1988  
 VERTICAL DATUM.

