

**CITY OF HOUSTON  
INVITATION TO BID**

**Issue Date: April 15, 2016**



**Bid Opening**

Sealed bids, in duplicate, must be received at the City of Houston, City Secretary's Office, City Hall Annex, Public Level, 900 Bagby, Houston, Texas 77002 **no later than Thursday, May 12, 2016 at 10:30 A.M.** No bids will be accepted after the stated deadline. All bids will be opened and publicly read in the City Council Chambers, City Hall Annex, Public Level, 900 Bagby at 11:00 A.M. on that date for the goods and services listed herein.

**VARIOUS TYPES AND SIZES OF PUMPS  
FOR THE DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
BID INVITATION NO: S63-N25780  
NIGP-730-64/720-73/720-17**

**Buyer**

Questions regarding this solicitation should be addressed/submitted to **Yesenia Chuca at 832-393-8727** or via e-mail at [yesenia.chuca@houstontx.gov](mailto:yesenia.chuca@houstontx.gov).

**ELECTRONIC BIDDING**

In order to submit a bid for the items associated with this procurement, you must fill in the pricing information on the "PLACE BID" page.

**Pre-Bid**

A Pre-Bid Conference will be held for all Prospective Bidders in the Strategic Procurement Division's Conference Room No.2, 901 Bagby, Houston, Texas 77002 at 2:00 p.m. Monday, April 25, 2016.

All Prospective Bidders are urged to be present. It is the bidder's responsibility to ensure that they have secured and thoroughly reviewed all aspects of the bidding documents prior to the Pre-Bid Conference. **Any revisions to be incorporated into this bidding document arising from discussions before, during and subsequent to the pre-bid conference will be confirmed in writing by Letter(s) of Clarification prior to the bid due date. No verbal responses will otherwise alter the specifications, terms and conditions as stated herein.**

Bidding forms, specifications and all necessary information should be downloaded from the Internet at <https://purchasing.houstontx.gov>. By registering and downloading this bid document, all updates to this bid document will be automatically forwarded via e-mail to any registered bidder. This information may also be obtained from the office of the City Purchasing Agent, 901 Bagby, Basement, Houston, Texas 77002.

The place of the bid opening may be transferred in accordance with Paragraph B (5) of Section 15-3 of The Code of Ordinances, Houston, Texas. The bid opening meeting may be rescheduled in accordance with Paragraph B (6) of said Section 15-3.

The City reserves the right to reject any or all bids or to accept any bid or combination of bids deemed advantageous to it.

**CITY EMPLOYEES ARE PROHIBITED FROM BIDDING ON THIS SOLICITATION IN ACCORDANCE WITH THE CODE OF ORDINANCES SECTION 15 - 1.**

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SECTION A. - OFFER  
SECTION B. - TECHNICAL SPECIFICATIONS  
SECTION C. - GENERAL TERMS & CONDITIONS

\*NOTE 1: Actual page numbers for each Section may change when the solicitation document is downloaded from the Internet or because of Letters of Clarification. Therefore, Bidders must read the bid document in its entirety and comply with all the requirements set forth therein.

\*NOTE 2: To be considered for award, please submit the electronic bid form and the forms listed in Section A, including the official signature page, which must be signed by a company official authorized to bind the company.

**SECTION A**  
**OFFICIAL BID FORM**



FORMAL ONE-TIME BID

**PURCHASE OF VARIOUS TYPES AND SIZES OF PUMPS  
FOR THE DEPARTMENT OF PUBLIC WORKS & ENGINEERING  
BID INVITATION No. S63-N25780  
NIGP-720-64/720-73/720-17**

To The Honorable Mayor  
and City Council Members  
of the City of Houston, Texas (the "City"):

The undersigned hereby offers to **furnish and deliver submersible and dry-pit pumps for the Department of Public Works and Engineering**, prepaid F.O.B. destination point Houston, Texas, the item(s) listed on the **electronic bid form** and on individual Purchase Orders, in accordance with the price(s) bid and other conditions shown herein, and in accordance with the City's Specifications and General Terms & Conditions and/or samples/drawings provided herein. When issued by the City of Houston, Letters of Clarification shall automatically become part of this bid document and shall supersede any previous specifications or provisions in conflict with Letters of Clarification. It is the responsibility of the bidder to ensure that it has obtained all such letters. By submitting a bid on this project, bidder shall be deemed to have received all Letters of Clarification and to have incorporated them into the bid.

The City may accept this bid offer by issuance of a Notice of Award Letter and/or a Purchase Order at any time on or before the 120th day following the day this Official Bid Form is opened by the City. This offer shall be irrevocable for 120 days after bid opening or for 90 days after City Council awards the bid, whichever comes last, but this period may be extended by written agreement of the parties.

**The City reserves the right to INCREASE quantities during the twelve-month (12) period following the issuance of the first purchase order subject to agreement in writing by the Contractor to honor the same bid price.**

The City reserves the option, after bids are opened, to adjust the quantities listed on the electronic bid form upward or downward, subject to the availability of funds, and/or make award (s) on a line item basis.

**SPECIAL BIDDERS NOTE:**

These bid documents are to be bid exactly as published or amended by any letter(s) of clarification that may be issued pertaining thereto.

**LINE ITEM BIDS:**

Only one item may be bid for each referenced line item. To bid the referenced line item and an alternate, bidder must submit a separate bid form for each alternate item(s) with its own original signature page. Multiple bids for the same line item on one bid form will be just cause to reject a bid from further consideration.

## **PROTEST**

A protest shall comply with and be resolved, according to the City of Houston Procurement Manual [http://purchasing.houstontx.gov/docs/Procurement\\_Manual.pdf](http://purchasing.houstontx.gov/docs/Procurement_Manual.pdf) and rules adopted thereunder. Protests shall be submitted in writing and filed with both, the City Attorney and the Solicitation contact person. A pre-award protest of the ITB shall be received five (5) days prior to the solicitation due date and a post-award protest shall be filed within five (5) days after City Council approval of the contract award.

A protest shall include the following:

- The name, address, e-mail, and telephone number of the protester;
- The signature of the protester or its representative who has the delegated authority to legally bind its company;
- Identification of the ITB description and the ITB or contract number;
- A detailed written statement of the legal and factual grounds of the protest, including copies of relevant documents, etc.; and
- The desired form of relief or outcome, which the protester is seeking

## **NO CONTACT PERIOD:**

Neither bidder(s) nor any person acting on bidder(s)'s behalf shall attempt to influence the outcome of the award by the offer, presentation or promise of gratuities, favors, or anything of value to any appointed or elected official or employee of the City of Houston, their families or staff members. All inquiries regarding the solicitation are to be directed to the designated City Representative identified on the first page of the solicitation. Upon issuance of the solicitation through the pre-award phase and up to the award, aside from bidder's formal response to the solicitation, communications publicly made during the official pre-bid conference, written requests for clarification during the period officially designated for such purpose by the City Representative, neither bidder(s) nor persons acting on their behalf shall communicate with any appointed or elected official or employee of the City of Houston, their families or staff through written or oral means in an attempt to persuade or influence the outcome of the award or to obtain or deliver information intended to or which could reasonably result in an advantage to any bidder. However, nothing in this paragraph shall prevent a bidder from making public statements to the City Council convened for a regularly scheduled session after the official selection has been made and placed on the City Council agenda for action.

## **HIRE HOUSTON FIRST:**

THIS PROCUREMENT IS SUBJECT TO THE HIRE HOUSTON FIRST PROGRAM, WHICH GIVES A PREFERENCE TO CERTAIN LOCAL BIDDERS IN AWARD OF THE PROCUREMENT. FOR MORE INFORMATION, GO TO:

<http://www.houstontx.gov/onestop/hirehoustonfirstaffidavit.pdf>

## **Designation as a City Business or Local Business**

To be designated as a City or Local Business for the purposes of the Hire Houston First Program, as set out in Article XI of Chapter 15 of the Houston City Code, a bidder or proposer must submit the **Hire Houston First Application and Affidavit ("HHF Affidavit")** to the Director of the Office of Business Opportunity and receive notice that the submission has been approved prior to award of a contract. Bidders are encouraged to secure a designation prior to submission of a bid or proposal if at all possible.

**Download the HHF Affidavit** from the Office of Business Opportunities Webpage at the City of Houston e-Government Website at the following location:

<http://www.houstontx.gov/hbsc/hirehoustonfirstaffidavit.pdf>

**Submit the completed application forms to: Office of Business Opportunity, Houston Business Solutions Center (HBSC), 611 Walker, Level, Houston, TX 77002 or Applications may be submitted via e-mail to [HoustonBSC@houstontx.gov](mailto:HoustonBSC@houstontx.gov) or faxed to 832.393.0952.**

**Award of a Procurement of \$100,000 or More for Purchase of Goods:**

THE CITY WILL AWARD THIS PROCUREMENT TO A "CITY BUSINESS," AS THAT TERM IS DEFINED IN SECTION 15-176 OF THE CITY OF HOUSTON CODE OF ORDINANCES ("THE CODE")

- IF THE BID OF THE CITY BUSINESS IS THE LOWEST RESPONSIBLE BID OR IS WITHIN **3%** OF THE LOWEST BID RECEIVED, AND
- UNLESS THE USER DEPARTMENT DETERMINES THAT SUCH AN AWARD WOULD UNDULY INTERFERE WITH CONTRACT NEEDS, AS PROVIDED IN SECTION 15-181 OF THE CODE.

IF THERE IS NO BID OF A CITY BUSINESS THAT MEETS THESE CRITERIA, THE CITY WILL AWARD THE PROCUREMENT TO THE LOWEST RESPONSIBLE BIDDER.

**Award of Procurement under \$100,000 for Purchase of Goods:**

THE CITY WILL AWARD THIS PROCUREMENT TO A "CITY BUSINESS," AS THAT TERM IS DEFINED IN SECTION 15-176 OF THE CITY OF HOUSTON CODE OF ORDINANCES ("THE CODE")

- IF THE BID OF THE CITY BUSINESS IS THE LOWEST RESPONSIBLE BID OR IS WITHIN **5%** OF THE LOWEST BID RECEIVED, AND
- UNLESS THE USER DEPARTMENT DETERMINES THAT SUCH AN AWARD WOULD UNDULY INTERFERE WITH CONTRACT NEEDS, AS PROVIDED IN SECTION 15-181 OF THE CODE.

IF THERE IS NO BID OF A CITY BUSINESS THAT MEETS THESE CRITERIA, THE CITY WILL AWARD THE PROCUREMENT TO THE LOWEST RESPONSIBLE BIDDER

**Award of Procurement that may be More or Less than \$100,000 for Purchase of Goods:**

THE CITY WILL AWARD THIS PROCUREMENT TO A "CITY BUSINESS," AS THAT TERM IS DEFINED IN SECTION 15-176 OF THE CITY OF HOUSTON CODE OF ORDINANCES ("THE CODE")

- IF THE BID OF THE CITY BUSINESS IS LESS THAN \$100,000 AND IS THE LOWEST RESPONSIBLE BID OR IS WITHIN **5%** OF THE LOWEST BID RECEIVED, OR
- IF THE BID OF THE CITY BUSINESS IS MORE THAN \$100,000 AND IS THE LOWEST RESPONSIBLE BID OR IS WITHIN **3%** OF THE LOWEST BID RECEIVED, AND
- UNLESS THE USER DEPARTMENT DETERMINES THAT SUCH AN AWARD WOULD UNDULY INTERFERE WITH CONTRACT NEEDS, AS PROVIDED IN SECTION 15-181 OF THE CODE.

IF THERE IS NO BID OF A CITY BUSINESS THAT MEETS THESE CRITERIA, THE CITY WILL AWARD THE PROCUREMENT TO THE LOWEST RESPONSIBLE BIDDER.

**Documents/forms must be downloaded from the City's Website:**

<https://houstontx.gov/purchasing/index.html>

**Additional Required Forms to be Included with this Bid:**

In addition to the electronic Bid Form and the Official Signature Page, the Forms listed in Table 1 **must be completed and submitted to the Office of the City Secretary on or before the date and time the bid is due:**

Table 1
<a href="#">Affidavit_of_Ownership</a>
<a href="#">Fair_Campaign_Ordinance</a>
<a href="#">Statement_of_Residency</a>
<a href="#">Conflict_of_Interest_Questionnaire</a>
<a href="#">Location_of_Bidders_Inventory</a>

Table 2 lists other documents and forms that should be viewed/downloaded from the City's website, but are not required to be submitted with the bid. The City will request these forms, as applicable, to be completed and submitted to the City by the recommended/successful bidder:

Table 2
<a href="#">Drug_Forms</a>
<a href="#">MWBE</a>
<a href="#">Certificate_of_Insurance</a>
<a href="#">Formal_Instructions_for_Price_List_Bidders</a>
<a href="#">Formal_Instructions_for_Bid_Terms</a>
<a href="#">EEOC</a>
<a href="#">Sample_Insurance_Endorsements</a>

**Note:**

1. Questions concerning the Bid should be submitted in writing to: City of Houston, Strategic Procurement Division, 901 Bagby, Room B500, Houston, TX 77002, Attn: Martin King / Yesenia Chuca or via fax: 832-393-8759 or via email (preferred method) to [yesenia.chuca@houstontx.gov](mailto:yesenia.chuca@houstontx.gov) no later than **4:00PM, Thursday, April 28, 2016.**
2. Although it is the intent of the City to award one contract as results of this invitation to bid, the City reserves the right to award by line item/group.

**SECTION B**  
**SPECIFICATIONS**

**PART I**

**GENERAL SPECIFICATIONS**

**1.0 BIDDING AND AWARD:**

- 1.1 The City may accept this bid offer by issuance of a Notice of Award Letter and/or a Purchase Order at any time on or before the 120th day following the day the Official Bid Form is opened by the City. This offer shall be irrevocable for 120 days after bid opening or for 90 days after City Council awards the bid, whichever comes last, but this period may be extended by written agreement of the parties.
- 1.2 Prices bid shall remain firm through delivery and shall not be subject to increases (or supplemented on the Contractor's invoice(s) for payment).
- 1.3 The City reserves the option to adjust the quantities listed on the City's Official Bid Form upward or downward, subject to the availability of funds, and/or make award on a line item basis. Therefore, the City shall not be liable for any contractual agreements/obligations the Bidder enters into based on the City purchasing all the quantities specified herein.
- 1.4 The City reserves the right to INCREASE quantities during the twelve-month period following the issuance of the first purchase order subject to agreement in writing by the Contractor to honor its original unit bid price.

**2.0 APPLICABLE SPECIFICATIONS:**

- 2.1 "Notice to Bidders", the "Official Bid Forms", the "General Specifications", the "Technical Specifications", the "General Terms and Conditions" and other specifications that may be included herewith and the purchase orders which refer to these specifications.

**3.0 TECHNICAL LITERATURE:**

- 3.1 To evaluate the bids, the user department and the City purchasing staff may require product literature/specification sheets. Technical literature may be provided with the bid submittal but is not required. However, the City reserves the right to request literature or clarifications, as needed, after bid submittal.
- 3.2 If required, the Bidder must submit a minimum of TWO SETS of the requested catalogue information, descriptive literature specifications and/or (if applicable) engineering drawings that completely identify the items bid. Bidder(s) shall furnish the requested literature within seven (7) calendar days after the receipt of the City's written request. FAILURE ON BIDDER'S PART TO FURNISH THE REQUESTED TECHNICAL DATA IN THE TIME LIMIT GIVEN MAY BE CAUSE FOR REJECTION OF THE BID.

**4.0 WARRANTY:**

- 4.1 A minimum twelve (12) month warranty on both materials and workmanship shall be provided. The warranty period shall commence the date the City officially accepts the completed item(s). When extended warranties are available as standard, they shall be included as a part of the bid for the benefit of the City. Any and all documents necessary to effect warranty shall be properly applied for and submitted by the Bidder.
- 4.2 Additional warranties required are listed in the Technical Specifications for each item.

4.3 With respect to any goods, materials, equipment, supplies and parts furnished by it, the Contractor warrants:

- That all items are new and free of defects in title, design, material and workmanship.
- That each item meets or exceeds the manufacturer's specifications and requirements for the equipment structure, or other improvement in which the item is installed and conforms in all respects to the terms of the City Purchase Order and Specifications.
- That each replacement item is new, in accordance with original equipment
- Manufacturer's specifications are of a quality of at least as good as the quality of the item that it replaces (when the replaced item was new).
- That no item or its use infringes any patent, copyright or proprietary right.

4.4 The Contractor's product shall be supported by an authorized service facility that can provide warranty repair, service and maintenance work within 24 hours from notification by the City.

4.5 Any warranty work shall be completed without cost to the City. The Contractor shall be responsible for all shipping and/or freight expense from the City's designated location to the Contractor's facility for all warranty repair and/or maintenance and return to the City's designated location.

## **5.0 DELIVERY/INSPECTION:**

5.1 The item(s) specified above, with delivery tickets and/or other required documents shall be delivered FOB Destination, to the location(s) shown on the purchase order(s) **within the delivery time(s) as listed in the Technical Specifications** after receipt of City of Houston Purchase Order.

5.2 The Contractor shall notify the City Contact listed in the "Ship To" section of the purchase order not less than three (3) days prior to expected delivery/arrival to permit inspection scheduling. The City's contact person shall advise the Contractor as to the date, time and location of authorized delivery/location. An authorized representative of the Contractor shall supervise delivery to the City. The City will not assume any liability for equipment delivered to an unauthorized location.

5.3 Documentation at time of Delivery:  
The Contractor shall provide the following documentation **per purchase order** upon delivery:

- Copy of purchase order(s) and original invoice(s).
- Warranty policy (ies) and/or certifications as may be required in the Specifications.
- Parts, service, operators and maintenance manual(s) as may be required in the Technical Specifications.

## **6.0 SHIPPING TERMS:**

6.1 Prices shall be prepaid F.O.B. Destination to the delivery locations, Houston, TX, as indicated on individual City of Houston purchase orders. The Contractor shall retain title and control of all goods until they are delivered and the contract of coverage has been completed. All risk of transportation and all related charges shall be the responsibility of the Contractor. All claims for visible or concealed damage shall be filed by the Contractor. The City will notify the Contractor promptly of any damaged goods and shall assist the Contractor in arranging for inspection.

7.0 **RESOLUTION OF LATE DELIVERY FOR EQUIPMENT:**

- 7.1 Time is of the essence in this Contract and accordingly all time limits shall be strictly construed and rigidly enforced. The work shall be furnished and fully completed within the delivery time specified in the Bid Proposal and Purchase Order to be furnished to the Contractor by the City. In the event that the work or any portions thereof shall remain uncompleted after expiration of the specified time, the Contractor shall furnish to the City a like number of comparable equipment for the City's use until such time as the ordered equipment are delivered. The equipment shall be furnished to the City with insurance to cover the use of this equipment by City personnel and in pursuit of the City's business. Should the Contractor not furnish such specified equipment during the late delivery period, the City retains the right to lease such equipment from a equipment leasing firm and the Contractor agrees and authorizes the City to deduct all such costs associated with such leases from the amounts due and owing to the Contractor under the Purchase Order. The City may avail itself of other remedies that may be available to it in law or equity as to any other event of default
- 7.2 The Contractor will not be liable for delays in performing its obligations to the extent such delays are caused by unforeseeable conditions that are beyond the Contractor's reasonable control and directly interfere with performance, and are without the Contractor's fault or negligence (force majeure). However, the Contractor shall provide written notice to the City of the cause and extent of an **excusable delay** requesting a time extension equal to the estimated duration thereof. Upon cessation of the event causing the delay, the Contractor shall provide written notice to the City of the actual delay incurred. Determination of force majeure shall rest solely with the City Purchasing Agent and the receiving department.

8.0 **CONFLICT IN TERMS:**

- 8.1 Should there be any conflict between the General Specifications and the Technical Specifications, the Technical Specifications shall prevail.

## SECTION B

### PART II

#### SCOPE OF WORK

#### **1.0 General:**

- 1.1 The Contractor shall be required to furnish all labor, supervision, transportation, permits, tools, consumables, safety equipment, testing and testing equipment necessary to furnish and deliver various types and sizes of pumps and pump motor in strict accordance with City of Houston (City) specifications included herein.
- 1.2 This procurement project consists of the purchase of various types and sizes of pumps with hard metal impellers for Public Works & Engineering Department (Department).

#### 1.3 Delivery Instructions:

- 1.3.1 The assembled pumps and applicable motors shall be delivered to the Department's Wastewater Operation Branch and Drinking Water Operation facilities, as specified herein and/or indicated in the purchase order by a delivery vehicle capable of off-loading the assembled unit(s) safely.
- 1.3.2 The assembled unit (s) shall be packaged to prevent any damage to the unit during transit and off-loading.
- 1.3.3 The delivery company shall be required to coordinate with the City official designated on the City of Houston Purchase Order (PO) to ensure the units are off-loaded safely.
- 1.3.4 Final Delivery details should also be coordinated with the Department contact person shown on the purchase order.

#### **1.4 General Specifications:**

- 1.4.1 **The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.**
- 1.4.2 The Contractor shall be required to deliver the complete pumps, including applicable, couplings, nord gears, control panels and baseplates, if required.

#### **2.0 Warranty:**

- 2.1 The Contractor shall warranty the pumps, motor and associated equipment for a minimum period of **one year**. The warranty shall include all parts, labor, material and transportation cost associated either performing the warranty repairs on site or at the contractors facility. The warranty shall begin subsequent to certification and acceptance of the equipment by the City.
- 2.2 The Contractor shall furnish to the City an Operation & Maintenance (O & M) Manual and any applicable literature and/or viable information associated with the equipment.

**SECTION B**

**PART III**

**SPECIFICATIONS**

**LINE ITEM NO. 1 – Electric Submersible Pump, w/Explosion Proof**

**Make: Flygt**

**Model: NS-3202 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Electric Submersible Pump, w/Explosion Proof**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment at **69<sup>th</sup> Street WWTP**, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used **in emergency situations to pump down a station flooding or needed to empty a wet well for repair.**

**Equipment:**

ELECTRIC SUBMERSIBLE PUMP, w/EXPLOSION PROOF

45Horse Power,

3Phase

60Hertz

460Volt

1750 RPM Motor,

Impeller #433

50ft of power cable

6 inch discharge bolt up flange

Head code: MT ( Medium Head ) / 79 feet

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least four (4) copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of **one year**, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's **69<sup>th</sup> Street WWTP, 2525 S/SGT. Macario Garcia Drive, Houston, TX 77020**, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with **the COH contact listed on the Purchase Order.**

**LINE ITEM NO. 2 – Electric Submersible Pump,**

**Make: Flygt**

**Model: NT-3202X or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Electric Submersible Pump**, for the **Beltway WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as “irregular” or “non-responsive”, any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder’s responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as “non-responsive”. All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment at **Beltway WWTP**, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder’s proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used **to send sludge back to the beginning of the treatment process, aiding in microbial reproduction and stabilization.**

**Equipment:**

- 12" Discharge, 45HP, 3PH/60HZ/460V, 1170RPM Motor, Impeller #616, w/50ft of power cable
- The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.
- The pump shall be supplied with a drilled flanges for dry pit use. The Pump will bolt in place with no piping changes.
- The pump shall be capable of delivering the design condition of 4041 GPM at 34.8 TDH.
- The pump shall operate at the design condition with an efficiency of 81 % and an NPSHR of 21.5.
- The pump shall also be able to operate 6401 GPM at 14 feet total head without vibration or cavitation.
- Shut off head shall be 65 feet (minimum).

**Motor:**

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least four (4) copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of **one year**, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's **CULLEN SERVICE CENTER, 7440 CULLEN, Houston, TX 77051**, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with **the COH contact listed on the Purchase Order..**

**LINE ITEM NO. 3 – Electric Submersible Pump**

**Make: Flygt**

**Model: CP-3531X or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Electric Submersible Pump**, for the **Keegans WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as “irregular” or “non-responsive”, any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder’s responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as “non-responsive”. All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment at **Keegans WWTP**, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder’s proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to lift raw sewage from the lift station wet well to the treatment process. The contractor shall provide the pump and all fittings, parts and modifications required for installation of the pump into the Wet well of the Lift Station at the Keegan’s Bayou Wastewater Treatment Plant Facility. The salient parameters of the Submersible Pumps currently installed and operational at this Lift Stations are as follows:

Pump and Motor, Submersible, Manufacturer: Flygt, Model CP-3531X, rated at 215 HP, 460 Volt, 3 Phase, 60 Hertz, 11000 GPM @ 42 ft of Head, with 80’ of power cable and 1 pilot cable and MAS pump protection relay.

**Performance:**

Pump shall pump at least 11000 gpm at 42 feet of head (water).

Shut off head shall be at least 94 feet of water.

Pump hydraulic efficiency at best efficiency point shall be 70% or greater.

Pump shall operate in the range of 600-720 RPM.

**Pump:**

Pump shall be constructed of metal capable of withstanding full submersion in corrosive environments and conditions as typically experienced in a wastewater lift station.

Pump seals shall be tungsten carbide, silicon carbide, or City of Houston approved equivalent.

Pump Impeller shall be manufactured from a corrosion resistant material and coated with a corrosive resistant coating to prolong life and reduce wear.

Pump Impeller shall be dynamically balanced.

Pump shall be able to pass a minimum of a 4 inch spherical solid.

Pump shall be equipped with mounting brackets to allow connection onto existing pump mounts.

**Motor:**

Shall comply with NEMA standard MG-1

Shall be 3-phase, 60-hertz, 460 volt, rated for continuous duty in at least 40\* C fluid.

Windings shall be insulated with at least Class F insulation.

Temperature measuring devices shall be imbedded in the windings to monitor temperature as an input to motor overload protection.

Combined service factor (combined effect of voltage, frequency, and specific gravity effects) shall be a minimum of 1.15.

Motor shall have NEMA PREMIUM electrical efficiency or equivalent.

Voltage tolerance shall be at least plus or minus 10%.

Power cable shall be sized according to NEC standards and shall be at least 80 feet long.

The motor and cable shall be capable of withstanding continuous submergence at 50 feet without loss of integrity.

Motor horsepower shall be 215 hp or greater so the motor will not overload throughout the entire range of pump performance from shutoff through run-out.

Motor and pump shall be on the same shaft.

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear for any of the Wet well Pumps of equivalent HP.

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Vendor to give training of required PM of Equipment, if needed.

Provide assistance to questions or follow-up training for the first (3) three months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of (18) months from shipment or one year from startup whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd, Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Mr. Ray Belton, Maintenance Section Chief, Wastewater Operations Branch, 7440 Cullen Blvd. Houston, Texas 77051 cell 713-562-4093.

**LINE ITEM NO. 4 – Electric Submersible Pump**

**Make: Flygt**

**Model: NP-3301X or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Electric Submersible Pump**, for the **Southwest WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as “irregular” or “non-responsive”, any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder’s responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as “non-responsive”. All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment at **Southwest WWTP**, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder’s proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to lift raw sewage from the lift station wet well to the treatment process. Contractor shall provide the pump and all fittings, parts and modifications required for installation of the pump into the Wet well of the Lift Station at the Southwest Wastewater Treatment Plant Facility. The parameters of the Small Submersible Pumps at this Lift Station are as follows:

Pump and Motor, Submersible, Manufacturer: Flygt, Model NP-3301X, rated at 85 HP, 460 Volt, 3 Phase, 60 Hertz, 1150 RPM, 7,064 GPM @ 34 ft of Head, with 50’ of 7 conductor SPC cable.

**Performance:**

Pump shall pump at least 7,064 GPM at 34 feet of head (water).

Shut off head shall be at least 61 feet of water.

Pump hydraulic efficiency at best efficiency point shall be 70% or greater.

Pump shall operate in the range of 1150-1185RPM.

**Pump:**

Pump shall be constructed of metal capable of withstanding full submersion in corrosive environments and conditions as typically experienced in a wastewater lift station.

Pump seals shall be tungsten carbide, silicon carbide, or City of Houston approved equivalent.

Pump Impeller shall be manufactured from a corrosion resistant material and coated with a corrosive resistant coating to prolong life and reduce wear.

Pump Impeller shall be dynamically balanced.

Pump shall be able to pass a minimum of a 4 inch spherical solid.

Pump shall be equipped with mounting brackets to allow connection onto existing pump mounts.

**Motor:**

Shall comply with NEMA standard MG-1

Shall be 3-phase, 60-hertz, 460 volt, rated for continuous duty in at least 40\* C fluid.

Windings shall be insulated with at least Class F insulation.

Temperature measuring devices shall be imbedded in the windings to monitor temperature as an input to motor overload protection.

Combined service factor (combined effect of voltage, frequency, and specific gravity effects) shall be a minimum of 1.15.

Motor shall have NEMA PREMIUM electrical efficiency or equivalent.

Voltage tolerance shall be at least plus or minus 10%.

Power cable shall be sized according to NEC standards and shall be at least 50 feet long.

The motor and cable shall be capable of withstanding continuous submergence at 20 feet without loss of integrity.

Motor horsepower shall be 85 HP or greater so the motor will not overload throughout the entire range of pump performance from shutoff through run-out.

Motor and pump shall be on the same shaft.

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear for any of the Wet well Pumps of equivalent HP.

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Vendor to give training of required PM of Equipment, if needed.

Provide assistance to questions or follow-up training for the first (3) three months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of (18) months from shipment or one year from startup whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd, Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Mr. Ray Belton, Maintenance Section Chief, Wastewater Operations Branch, 7440 Cullen Blvd. Houston, Texas 77051 cell 713-562-4093.

**LINE ITEM NO. 5 – Electric Submersible Sludge Pump**

**Make: Flygt**

**Model: CP-3531X or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Electric Submersible Sludge Pump**, for the **Sims South WWTP**.

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as “irregular” or “non-responsive”, any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder’s responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as “non-responsive”. All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder’s proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to return sludge to the aeration process.

Submersible non-clog wastewater pump

Closed coupled explosion proof

Horsepower: 170 HP

Submersible electric motor connected for operation on 460 volts, 3 phase, 60 HZ, 900 RPM,

4 wire service with 85 linear feet of submersible cable (SUBCAB) suitable for submersible pump applications. Sized according to NEC and ICEA standards.

80 linear feet of multi-conductor submersible cable (SUBCAB) will be used to convey pump monitoring device signals.

**Design Configuration:**

Mating cast iron 20 inch discharge connection

11,000 GPM at 36 feet TDH

Pump efficiency: 87.5%

NPSH: 23 feet

Premium efficiency motor efficiency: 88.5% minimum

Shut Off Head: 76 feet minimum

The pump shall be automatically and firmly connected to the discharge connection, guided by no led than two guide bars extending from the top of the station to the discharge connection.

Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal water tight contact.

Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be accepted.  
No portion of the pump shall bear directly on the sump floor.  
Pump shall be capable of operating on a continuous non submerged condition in a dry pit installation.

### **Pump:**

Component Material: Gray cast iron, ASTM A 48, Class 35B with smooth surfaces devoid of blow holes or other casting irregularities.

Exposed Nuts and Bolts: 316 stainless steel construction.

All metal surfaces coming into contact with the pumped media, other than stainless steel, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing: shall incorporate metal to metal contact between machine surfaces. Pump/motor unit mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or optional Viton rubber O rings. Joint sealing will be the result of controlled compression of rubber O –rings in two planes and O-ring contact on four sides without the requirement of a specific bolt torque limit.

Rectangular cross sectioned rubber, paper or synthetic gaskets that require specific torque limits to achieve compression shall not be considered as adequate or equal.

No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

### **Cooling System:**

Each unit shall be provided with an integral motor cooling system.

A motor cooling jacket shall encircle the stator housing providing for dissipation of motor heat regardless of the type of pump installation.

An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket.

The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer.

The cooling system shall have one fill port and one drain port integral to the cooling jacket.

The cooling system shall provide continuous pump operation in liquid or ambient temperatures of up to 104 degrees Fahrenheit (40 degrees Celsius).

Operational restrictions at temperatures below 104 degrees Fahrenheit are not acceptable.

Fans, blowers or auxiliary cooling systems that are mounted external to the pump motor are not acceptable.

### **Cable Entry Seal:**

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal.

The cable entry shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable outside diameter and the cable entry inside diameter.

The grommets shall be compressed by the cable entry unit, thus providing a strain relief function.

The assembly shall provide ease of changing the cable when necessary using the same entry seal.

The cable entry junction chamber and motor shall be sealed from each other, which shall isolate the stator housing from foreign material gaining access through the pump top.

Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.

### **Motor:**

The pump motor shall be an **Explosion-Proof** motor of NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber.

The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%.

The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31.

The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable.

The motor shall be specifically designed for submersible pump usage and designed for continuous duty pumping media of up to 40°C (104°F) with an 80°C temperature rise and capable of at least 15 evenly spaced starts per hour.

The rotor bars and short circuit rings shall be made of cast aluminum. Pumps using 9xx series drive units are capable of 15 evenly spaced starts per hour.

Three embedded thermal switches shall be embedded in the stator end coils to monitor the temperature of each phase winding. 2.6.8

One PT-100 type temperature sensor shall be installed in the stator winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel.

The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals.

A mechanical float switch (FLS) shall be mounted in the junction chamber to signal if there is water intrusion.

A pump memory module shall be provided and mounted in the junction chamber to record pump run time, number of starts as well as contain the motor unit performance and manufacturing data and service history.

The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.

The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C.

A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no load characteristics.

The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut off through run out.

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

## **PILOT CABLE**

The pilot cable shall be designed specifically for use with submersible pumps and shall be type SUBCAB (SUBmersible CABLE).

The cable shall be multi-conductor type with stainless steel braided shielding, a chlorinated polyethylene rubber outer jacket and tinned copper conductors insulated with ethylene-propylene rubber.

The conductors shall be arranged in twisted pairs.

The cable shall be rated for 600 Volts and 90°C (194°F) with a 40°C (104°F) ambient temperature and shall be approved by Factory Mutual (FM).

The cable length shall be adequate to reach the junction box without the need for splices.

## **BEARINGS**

The pump shaft shall rotate on at least three grease-lubricated bearings.

The upper bearing, provided for radial forces, shall be a single roller bearing.

The lower bearings shall consist of at least one roller bearing for radial forces and one or two angular contact ball bearings for axial thrust.

The minimum L10 bearing life shall be 100,000 hours at any point along the usable portion of the pump curve at maximum product speed.

The lower bearing housing shall include an independent thermal sensor to monitor the bearing temperature. If a high temperature occurs, the sensor shall activate an alarm and shut the pump down.

## **MECHANICAL SEAL**

Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring.

The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide ring.

The upper secondary seal, located between the seal chamber and the seal inspection chamber shall be a leakage-free seal. The upper seal shall contain one stationary and one positively driven rotating corrosion resistant tungsten-carbide seal ring.

The rotating seal ring shall have small back-swept grooves laser inscribed upon its face to act as a pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber.

All seal rings shall be individual solid sintered rings (metallurgical fuses the particles without melting them or gluing them).

Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing.

Mounting of the lower seal on the impeller hub is not acceptable.

Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable.

The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.

The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

A separate seal leakage chamber shall be provided so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be equipped with a float type switch that will signal if the chamber should reach 50% capacity.

## **PUMP SHAFT**

Pump and motor shaft shall be a solid continuous shaft. The pump shaft is an extension of the motor shaft.

Pieced shafts or the use of couplings shall not be acceptable.

The pump shaft shall be of AISI 431 stainless steel and shall be completely isolated from the pumped liquid.

## **IMPELLER**

Shall be NO. 1040

The impeller(s) shall be of gray cast iron, Class 35B, dynamically balanced, multiple vaned, double shrouded non clogging design having long throughlets without acute turns.

The impeller(s) shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in wastewater.

Impeller(s) shall be keyed to the shaft, retained with an expansion ring and shall be capable of passing a minimum 4.13 inch diameter solid.

All impellers shall be coated with an acrylic dispersion zinc phosphate primer.

## **WEAR RINGS**

A wear ring system shall be used to provide efficient sealing between the volute and suction inlet of the impeller.

Each pump shall be equipped with a brass ring insert that is drive fitted to the volute inlet.

This pump shall also have a stainless steel impeller wear ring heat shrink fitted onto the suction inlet of the impeller.

## **VOLUTE**

Pump volute(s) shall be single piece gray cast iron, Class 35B, non-concentric design with smooth passages large enough to pass any solids that may enter the impeller.

Minimum inlet and discharge size and flange connections shall match field conditions.

## **PROTECTION**

All stators shall incorporate three thermal switches, connected in series, to provide over temperature protection of the motor winding.

Should high temperature occur, the thermal switches shall open, stop the motor and activate an alarm.

The stator shall also include one PT-100 type temperature probe to provide for monitoring of the stator temperature.

A lower bearing temperature sensor shall be provided. The sensor shall directly contact the outer race of the thrust bearing providing for accurate temperature monitoring.

Two leakage sensors shall be provided to detect water intrusion into the stator chamber and junction chamber.

A Float Leakage Sensor (FLS), a small float switch, shall be used to detect the presence of water in either the stator chamber or junction chamber. When activated, the FLS will stop the motor and activate an alarm. USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS SHALL NOT BE ALLOWED.

All protection devices shall work with the existing pump protection module installed in the existing control.

## **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd, Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the purchase order.

**LINE ITEM NO. 6 - Pump, Submersible, Electric, Explosion Proof**

**Make: Flygt**

**Model: NP-3127.095 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Submersible, Electric, Explosion Proof Pump**, for **Wastewater Operations**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here must be able to be installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment to pump raw unscreened wastewater at various lift stations City wide.

**Pump:**

4" DRILLED DISCHARGE, w/EXPLOSION PROOF  
10HP,  
3PH/60HZ/230-460V,  
OPERATING FLOW (Required) 660 GPM @ 38 ft. TDH  
SECOND DUTY POINT 1200 GPM @ 16 ft. TDH  
MAXIMUM NPSHR 27 Feet  
MINIMUM EFFICIENCY 77.3%  
SUCTION SIZE 4 in  
ROTATION Clockwise  
SOLID DIAMETER 3 IN  
TYPE OF SEAL Corrosion resistant tungsten-carbide

**Motor:**

1750RPM MOTOR, IMPELLER #438, w/50ft OF POWER CABLE

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of (1) year from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7400 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Vendor shall be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation

Final Delivery details should also be coordinated with Arturo Carrillo, Lift Station Maintenance, Wastewater Operations Branch, 7440 Cullen, Houston, Texas 77051 (Phone # 832-395-3558).

**LINE ITEM NO. 7 - Pumps, Electric, Submersible**

**Make: Flygt**

**Model: NP-3153.095 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pumps, Electric, Submersible**, for **Wastewater Operations**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified must be able to be installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment to pump raw unscreened wastewater at various lift stations City wide.

**Pump:**

6" DRILLED DISCHARGE, w/EXPLOSION PROOF  
20HP, 3PH/60HZ/230-460V,  
1750RPM MOTOR, IMPELLER #433, w/50ft OF POWER CABLE

OPERATING FLOW (Required)	1080 GPM @ 54 ft. TDH
SECOND DUTY POINT	1880 GPM @ 25 ft. TDH
MAXIMUM NPSHR	94 Feet
MINIMUM EFFICIENCY	81.4%
SUCTION SIZE	6 in
DISCHARGE SIZE	6 in
ROTATION	Clockwise
SOLID DIAMETER	4 IN
TYPE OF SEAL	Corrosion resistant tungsten

**Motor:**

1750RPM MOTOR, IMPELLER #433, w/50ft OF POWER CABLE

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one year from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7400 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Vendor shall be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Final Delivery details should also be coordinated with Arturo Carrillo, Lift Station Maintenance, Wastewater Operations Branch, 7440 Cullen, Houston, Texas 77051 (Phone # 832-395-3558).

**LINE ITEM NO. 8 - Pump, Electric, Submersible, Explosion Proof**

**Make: Flygt**

**Model: CP-3356.775 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing, **Electric, Submersible, Explosion Proof Pump**, for the Almeda WWTP.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment at **Almeda WWTP**, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to transport raw sewage for processing.

**Pump:**

14" DISCHARGE, w/EXPLOSION PROOF

280HP,

3PH/60HZ/460V,

Operating Flow (Required) 10,000 GPM @80 FT TDH

IMP# 495mm

Voltage / Phase 460V / 3 Phase,

Power Cables & Pilot Cable 80 feet

Frequency 60 Hz

Discharge size 14 inch

PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION

**Motor:**

1180 RPM MOTOR, IMPELLER #620, w/(2) 80ft OF POWER CABLE, AND (1) 80' PILOT CABLE

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 1 year from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Richard Bellinger, Assistant PW Maintenance Manager, Wastewater Treatment Maintenance, Wastewater Operations Branch, 7440 Cullen, Houston, Texas 77051 ( Phone # 832-395-3535) or (713)591-8663.

**LINE ITEM NO. 9 - Pump, Submersible, Electric**

**Make: Flygt**

**Model: NP-3202 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric**, for the **Homestead WWTP/ Willowrun**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to move water from the lift station to the head of the plant. The pump must be able to be installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment.

**Pump:**

Submersible non-clog wastewater pumps.

Each pump shall be equipped with a 35 HP submersible electric motor, connected for operation on 460 volts, 3 phase, 60 hertz, 4 wire service, with 50 feet of submersible cable suitable for submersible pump applications.

The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

The pump shall be capable of operating with existing 12 inch discharge connection with no modification or extra cost to the City.

The pump shall be supplied with a drilled flanges for portable or dry pit use.

The pump shall be capable of delivering the design condition of 3720 GPM at 27 TDH.

The pump shall operate at the design condition with an efficiency of 77.5 % and an NPSHR of 21.2.

The pump shall also be able to operate 5500 GPM at 10 feet total head without vibration or cavitations.

Shut off head shall be 45 feet (minimum).

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least four (4) copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the purchase order.

**LINE ITEM NO. 10 - Pump, Submersible, Electric**

**Make: Flygt**

**Model: NP-3171 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric**, for the **Northside Satellite Plants**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to de-water plants and basins. The pump must be able to be installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment.

**Pump:**

Submersible non-clog wastewater pumps.

Each pump shall be equipped with a 32 HP submersible explosion-proof electric motor, connected for operation on 230 and 460 volts, 3 phase, 60 hertz, 4 wire service, with 50 feet of submersible cable suitable for submersible pump applications.

The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

The pump shall be capable of operating with existing 6 inch Flygt Corporation discharge connection with no modification or extra cost to the City.

The pump shall be supplied with a drilled flanges and a stand for portable use.

The pump shall be capable of delivering the design condition of 1368 GPM at 64 TDH.

The pump shall operate at the design condition with an efficiency of 79 %.

The pump shall also be able to operate 1900 GPM at 45 feet total head without vibration or cavitations.

Shut off head shall be 115 feet (minimum).

**Manufacturers/ Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from startup whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the purchase order.

**LINE ITEM NO. 11 - Pump, Submersible, Electric, Explosion Proof**

**Make: Flygt**

**Model: NP-3202 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric, Explosion Proof**, for the **Northside Satellite Plants**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to de-water plants and basins. The pump must be able to be installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment.

**Pump:**

Submersible non-clog wastewater pumps.

Each pump shall be equipped with a 45 HP submersible electric motor, connected for operation on 460 volts, 3 phase, 60 hertz, 4 wire service, with 50 feet of submersible cable suitable for submersible pump applications.

The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

The pump shall be capable of operating with existing 8 inch discharge connection with no modification or extra cost to the City.

The pump shall be supplied with a drilled flanges for portable or dry pit use.

The pump shall be capable of delivering the design condition of 2136 GPM at 47 TDH.

The pump shall operate at the design condition with an efficiency of 81 % and an NPSHR of 13.4.

The pump shall also be able to operate 3600 GPM at 20 feet total head without vibration or cavitations.

Shut off head shall be 84 feet (minimum).

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with the COH contact listed on the purchase order.

**LINE ITEM NO. 12 - Pump, Submersible, Electric**

**Make: Flygt**

**Model: NP-3301 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric**, for the **Northside Satellite Plants**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified must be able to be installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment.

**Pump:**

Submersible non-clog wastewater pump.

Each pump shall be equipped with a 85 HP submersible electric motor, connected for operation on 460 volts, 3 phase, 60 hertz, 4 wire service, with 50 feet of submersible cable suitable for submersible pump applications.

The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

The pump shall be capable of operating with existing 6 inch discharge connection with no modification or extra cost to the City.

The pump shall be supplied with a drilled flanges for portable or dry pit use.

The pump shall be capable of delivering the design condition of 1661 GPM at 131 TDH.

The pump shall operate at the design condition with an efficiency of 72.5 % and an NPSHR of 20.4.

The pump shall also be able to operate 2100 GPM at 100 feet total head without vibration or cavitations.

Shut off head shall be 240 feet (minimum).

**Motor:**

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the purchase order.

**LINE ITEM NO. 13 - Pump, Submersible, Electric, Explosion Proof**

**Make: Flygt**

**Model: NP-3127.090 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric, Explosion Proof.**

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

Furnish submersible non-clog wastewater pumps. Each pump shall be equipped with a 10 HP submersible electric Explosion-Proof motor, connected for operation on 460 volts, 3 phase, 60 hertz, 4 wire service. The motor must be voltage changeable to 230 volt by a simple wiring change. The pump will be supplied with 50 feet of submersible cable suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The pump shall be capable of operating with existing 4 inch Flygt Corporation discharge connection with no modification or extra cost to the City. The pump shall be supplied with a drilled flanges and a stand for portable use. The pump shall be capable of delivering the design condition of 530 GPM at 49 TDH. The pump shall operate at the design condition with an efficiency of 73.4 % without vibration or cavitation. The pump shall also be able to operate 700 GPM at 38 feet total head without vibration or cavitation. Shut off head shall be 84 feet (minimum).

MINIMUM SHUTOFF HEAD: 84 FT

MAXIMUM MOTOR HP: 10 HP

MINIMUM HYDRAULIC EFF. (@ Design): N/A

MAXIMUM MOTOR RPM: 1720 RPM

FULL LOAD AMPS: N/A

VOLTAGE: 460 VOLTS 60 HZ

SOLID DIAMETER: 3 IN

SUCTION SIZE : 4 INCH

DISCHARGE SIZE: 4 INCH

PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION

**Motor:**

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the purchase order.

**LINE ITEM NO. 14 - Pump, Submersible, Electric**

**Make: Flygt**

**Model: NP-3202 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric**, for the **Northeast WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to move water from the lift station to the head of the plant. The pump must be able to be installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment.

**Pump:**

Submersible non-clog wastewater pumps.

Shall be equipped with a 60 HP submersible electric motor, connected for operation on 460 volts, 3 phase, 60 hertz, 4 wire service, with 50 feet of submersible cable suitable for submersible pump applications.

Power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

The pump shall be capable of operating with existing 6 inch discharge connection with no modification or extra cost to the City.

The pump shall be supplied with a drilled flanges for portable or dry pit use.

The pump shall be capable of delivering the design condition of 1423 GPM at 90 TDH.

The pump shall operate at the design condition with an efficiency of 72 % and an NPSHR of 20.

The pump shall also be able to operate 1940 GPM at 70 feet total head without vibration or cavitations.

Shut off head shall be 160 feet (minimum).

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the purchase order.

**LINE ITEM NO. 15 - Pumps, Electric, Submersible**

**Make: Flygt**

**Model: NP-3153 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pumps, Electric, Submersible**, for **North Gate WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified must be able to be installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment.

**Pump:**

Submersible non-clog wastewater pump.

Each pump shall be equipped with a 20 HP submersible explosion-proof electric motor, connected for operation on 230 and 460 volts, 3 phase, 60 hertz, 4 wire service, with 50 feet of submersible cable suitable for submersible pump applications.

The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval.

The pump shall be capable of operating with existing 8 inch Flygt Corporation discharge connection with no modification or extra cost to the City.

The pump shall be supplied with a drilled flanges and a stand for portable use.

The pump shall be capable of delivering the design condition of 1597 GPM at 34 TDH.

The pump shall operate at the design condition with an efficiency of 80 %.

The pump shall also be able to operate 2300 GPM at 18 feet total head without vibration or cavitations.

Shut off head shall be 68 feet (minimum)

**Motor:**

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one year from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7400 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Vendor shall be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Final Delivery details should also be coordinated with COH contact listed on the purchase order.

**LINE ITEM NO. 16 - Pumps, Electric, Submersible**

**Make: Flygt**

**Model: NZ-3153.181 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pumps, Electric, Submersible**, for **North Gate WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall..

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**APPLICATION**

The pump supplied shall be suitable for use in either primary / WAS / RAS / mixed / aerobic – anaerobic digested / thickened / chemical, etc. Sludge containing total solids concentration up to 8 %.

**REQUIREMENTS**

Furnish and install \_\_\_ submersible non-clog wastewater pumps. Each pump shall be equipped with an 20 HP submersible electric motor connected for operation on 460 volts, 3 phase, 60 hertz, 4 wire service, with 50 feet of submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and have P-MSHA Approval.

**PUMP DESIGN CONFIGURATIONS (Dry pit installation)**

Pump shall be capable of operating in a continuous non submerged condition in horizontal (NZ) position in a dry pit installation, permanently connected to inlet and outlet pipes. Pump shall be of submersible construction and will continue to operate satisfactorily should the dry pit be subjected to flooding.

### **NZ configurations (pump in horizontal position):**

Pump shall have a stainless steel telescoping inlet pipe for ease of inspection. Pressure gauge connection shall be included standard on telescoping inlet pipe. The volute shall have a conveniently located drain tube to aid with inspection and or maintenance operations. Optional service cart shall be available for safe handling during maintenance.

### **PUMP DESIGN CONFIGURATION**

The pump shall be supplied with a 6 inch discharge flange and be capable of delivering 1062 GPM at 47 FT, at 79 % efficiency and an NPSHR of 22 ft. TDH. An additional point on the same curve shall be 1800 GPM at 20 feet total head. Shut off head shall be 82 feet (minimum). The pumps shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor. Each pump shall be fitted with \_\_\_\_\_ feet of \_\_\_\_\_ lifting chain or stainless steel cable. The working load of the lifting system shall be 50% greater than the pump unit weight.

### **PUMP CONSTRUCTION**

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be of stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

### **COOLING SYSTEM**

Each unit shall be provided with an integral motor cooling system. A stainless steel motor cooling jacket shall encircle the stator housing, providing for dissipation of motor heat regardless of the type of pump installation. An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the cooling jacket. The cooling system shall provide for continuous pump operation in liquid or ambient temperatures of up to 104°F (40°C). Operational restrictions at temperatures below 104°F are not acceptable. Fans, blowers or auxiliary cooling systems that are mounted external to the pump motor are not acceptable.

### **CABLE ENTRY SEAL**

The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of dual cylindrical elastomer grommets, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter. The grommets shall be compressed by the cable entry unit, thus providing a strain relief function. The assembly shall provide ease of changing the cable when necessary using the same entry seal. The cable entry junction chamber and motor shall be sealed from each other, which shall isolate the stator housing from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered equal.

## **MOTOR**

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of pins, bolts, screws or other fastening devices used to locate or hold the stator and that penetrate the stator housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum. Three thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the motor control panel. The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.

The motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of +/- 10%. The motor shall be designed for continuous operation in up to a 40°C ambient and shall have a NEMA Class B maximum operating temperature rise of 80°C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics.

Motor horsepower shall be sufficient so that the pump is non-overloading throughout its entire performance curve, from shut-off to run-out. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

### **Optional - Shielded Power Cable:**

The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The power cable shall be of a shielded design in which an overall tinned copper shield is included and each individual phase conductor is shielded with an aluminum coated foil wrap. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater.

**This cable is required for use with Flygt SmartRun™ intelligent controls.**

## **BEARINGS**

The integral pump/motor shaft shall rotate on two bearings. The motor bearings shall be sealed and permanently grease lubricated with high temperature grease. The upper motor bearing shall be a two row angular contact ball bearing to handle radial loads. The lower bearing shall be a two row angular contact ball bearing to handle the thrust and radial forces. The minimum L<sub>10</sub> bearing life shall be 50,000 hours at any usable portion of the pump curve.

## **MECHANICAL SEALS**

Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion and abrasion resistant tungsten-carbide ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber shall be a leakage-free seal. The upper seal shall contain one stationary and one positively driven rotating corrosion and abrasion resistant tungsten-carbide seal ring. The rotating seal ring shall have small back-swept grooves laser inscribed upon its face to act as a pump as it rotates, returning any fluid that should enter the dry motor chamber back into the lubricant chamber. All seal rings shall be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.

The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

A separate seal leakage chamber shall be provided so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be equipped with a float type switch that will signal if the chamber should reach 50% capacity.

## **PUMP SHAFT**

The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shafts using mechanical couplings shall not be acceptable. The shaft shall be stainless steel – ASTM A479 S43100-T. Shaft sleeves will not be acceptable.

## **IMPELLER**

The impeller shall be of ASTM A-48, Class 35B grey iron, dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove

located on the volute suction. The leading edges of the impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impeller shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

## **VOLUTE / SUCTION COVER**

The pump volute shall be a single piece grey cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have a replaceable suction cover insert ring in which are cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be of ASTM A-48, Class 35B grey iron and provide effective sealing between the multi-vane semi-open impeller and the volute housing.

## **PROTECTION**

Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection.

The thermal switches and float switch shall be connected to a Mini CAS control and status monitoring unit. The Mini CAS unit shall be designed to be mounted in the pump control panel.

## **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

## **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

## **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one year from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered to the address listed on the COH Purchase Order, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Vendor shall be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Final Delivery details should also be coordinated with COH contact listed on the purchase order.

**LINE ITEM NO. 17 - Pump, Submersible, Electric, Explosion Proof**

**Make: Flygt**

**Model: NP 3127 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric, Explosion Proof**, for the **Northeast Treatment Plant**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall..

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump must be able to be capable of being installed in dry pit application with no modification and be rated for continuous duty in a completely dry environment.

The pumps shall be capable of being used in a portable configuration.

**Pump:**

Furnish submersible non-clog wastewater pumps. Each pump shall be equipped with a 10 HP submersible electric Explosion-Proof motor, connected for operation on 460 volts, 3 phase, 60 hertz, 4 wire service. The motor must be voltage changeable to 230 volt by a simple wiring change. The pump will be supplied with 50 feet of submersible cable suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The pump shall be capable of operating with existing 4 inch Flygt Corporation discharge connection with no modification or extra cost to the City. The pump shall be supplied with a drilled flanges and a stand for portable use. The pump shall be capable of delivering the design condition of 530 GPM at 49 TDH. The pump shall operate at the design condition with an efficiency of 73.4 % without vibration or cavitation. The pump shall also be able to operate 700 GPM at 38 feet total head without vibration or cavitation. Shut off head shall be 84 feet (minimum).

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts or bolts shall be AISI type 304 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

**Cooling System:** Motors are sufficiently cooled by the surrounding environment or pumped media. A water jacket is not required.

OPERATING CONDITIONS	N/A GPM @ N/A TDH
MINIMUM SHUTOFF HEAD	84 FT
MAXIMUM MOTOR HP	10 HP
MINIMUM HYDRAULIC EFF. (@ Design)	N/A
MAXIMUM MOTOR RPM	1720 RPM
FULL LOAD AMPS	N/A
VOLTAGE	460 VOLTS 60 HZ
SOLID DIAMETER	3 IN
SUCTION SIZE : 4 INCH DISCHARGE SIZE: 4 INCH	
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION	

**POWER CABLE:** Provide 50 ft. of power/control cable with each pump, suitable for submersible wastewater application, sized in accordance with NEC requirements. Provide cable terminal box on side of motor housing, with cable entry sealed to insure that no entry of moisture is possible into the high-voltage motor/ terminal area even if the cable is damaged or severed below water level. Cable seal shall include a compressed rubber grommet to seal the cable exterior and epoxy fill to seal the interior passages. A strain relief device, in direct contact with both the cable and the cast iron entry housing, shall be provided. The cable entry shall be rated by Factory Mutual (or UL) for submerged operating depths to 85 feet.

**TEMPERATURE PROTECTION:** All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. The thermal switches shall open at 125°C (260°F), stop the motor and activate an alarm.

**SEAL LEAK DETECTION:** A leakage sensor shall be available as an option to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and send an alarm both local and/or remote. USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 125°C (260°F) SHALL NOT BE ALLOWED.

The thermal switches and FLS shall be connected to the existing Mini CAS (Control and Status) monitoring unit.

Note: FLS not available in NZ configuration.

**IMPELLER :** The impeller(s) shall be of gray cast iron, Class 35B, dynamically balanced, semi-open, multi-vane, back-swept, non-clog design. The impeller vane leading edges shall be mechanically self-cleaned upon each rotation as they pass across a spiral groove located on the volute suction which shall keep them clear of debris, maintaining an unobstructed leading edge. The impeller(s) vanes shall have screw-shaped leading edges that are hardened to Rc 45 and shall be capable of handling solids, fibrous materials, and other matter found in waste water and sludge with up to 7% solids. Impellers shall be locked to the shaft and held by an impeller bolt.

**SHAFT:** Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The shaft shall be stainless steel- ASTM A479 S43100-T. If a shaft material of lower quality than stainless steel-ASTM A479 S43100-T is used, a shaft sleeve of stainless steel ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided in the oil housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

**SHAFT SEAL:** Provide a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals should operate in an lubricant reservoir that hydrodynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion resistant tungsten-carbide ring. The upper, secondary seal unit, located between

the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion resistant **tungsten-carbide** seal ring. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor **depend on direction of rotation for sealing**. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available.

**BEARINGS:** The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces.

**MOTOR:** The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 15 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The junction chamber containing the terminal board, shall be hermetically sealed from the motor by an elastomer compression seal. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board. The motor and the pump shall be produced by the same manufacturer. The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

**Requirement:** Furnish submersible non-clog wastewater pumps. Each pump shall be equipped with a 10 HP submersible electric Explosion-Proof motor, connected for operation on 460 volts, 3 phase, 60 hertz, 4 wire service. The motor must be voltage changeable to 230 volt by a simple wiring change. The pump will be supplied with 50 feet of submersible cable suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The pump shall be capable of operating with existing 4 inch Flygt Corporation discharge connection with no modification or extra cost to the City. The pump shall be supplied with a drilled flanges and a stand for portable use. The pump shall be capable of delivering the design condition of 530 GPM at 49 TDH. The pump shall operate at the design condition with an efficiency of 73.4 % without vibration or cavitation. The pump shall also be able to operate 700 GPM at 38 feet total head without vibration or cavitation. Shut off head shall be 84 feet (minimum).

#### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

#### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Mr. Arturo Carrillo, 7440 Cullen, Houston, Texas 77051 (Phone # 832-395-3558).

**LINE ITEM NO. 18 - Pump, Submersible, Electric**

**Make: Flygt**

**Model: NP 3127X or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

Furnish submersible non-clog wastewater pumps. Each pump shall be equipped with a **10** HP submersible electric motor, connected for operation on **230 and 460 volts, 3 phase**, 60 hertz, **4** wire service, with **50** feet of submersible cable suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The pump shall be capable of operating with existing **6** inch Flygt Corporation discharge connection with no modification or extra cost to the City. **The pump shall be supplied with a drilled flanges and a stand for portable use. The pump shall be capable of delivering the design condition of 800 GPM at 35 TDH.** The pump shall operate at the design condition with an efficiency of **77.3 %**. **The pump shall also be able to operate 1300 GPM at 15 feet total head with out vibration or cavitations. Shut off head shall be 66 feet (minimum).**

The pump must be able to be installed in dry pit application **with no modification and be rated for continuous duty in a completely dry environment.**

**PUMP DESIGN**

The pumps shall be capable of being used in a portable configuration or with a Flygt guide rail configuration with existing discharge connections.

**PUMP CONSTRUCTION**

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts or bolts shall be of stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

## COOLING SYSTEM

Motors are sufficiently cooled by the surrounding environment or pumped media. A water jacket is not required.

## MOTOR

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant **Class H insulation** rated for 180oC (356oF). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of pins, bolts, screws or other fastening devices used to locate or hold the stator and that penetrate the stator housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of withstanding at least 15 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum. Three thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the motor control panel.

**The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.**

The motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of +/- 10%. The motor shall be designed for continuous operation in up to a 40°C. ambient and shall have a NEMA Class B maximum operating temperature rise of 80° C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics.

Motor horsepower shall be sufficient so that the pump is non-overloading throughout its entire performance curve, from shut-off to run-out.

## BEARINGS

The integral pump/motor shaft shall rotate on two bearings. The motor bearings shall be sealed and permanently grease lubricated with high temperature grease. The upper motor bearing shall be a single ball type bearing to handle radial loads. The lower bearing shall be a two row angular contact ball bearing to handle the thrust and radial forces. The minimum L10 bearing life shall be **50,000 hours at any usable portion of the pump curve.**

## MECHANICAL SEALS

Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion resistant **tungsten-carbide** ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber, shall contain one stationary and one positively driven rotating corrosion resistant **tungsten-carbide** seal ring. All seal rings shall be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.

The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

A separate seal leakage chamber shall be provided so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be equipped with a float type switch that will signal if the chamber should reach 50% capacity.

#### **PUMP SHAFT**

The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shafts using mechanical couplings shall not be acceptable. The shaft shall be AISI type 431 stainless steel. Shaft sleeves will not be acceptable.

#### **IMPELLER**

The impeller shall be of gray cast iron, ASTM A-48 Class 35B, dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer.

#### **VOLUTE/SUCTION COVER**

The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have integral spiral-shaped, sharp-edged groove(s) that is cast into the suction cover. The spiral groove(s) shall provide the sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The internal volute bottom shall provide effective sealing between the multi-vane semi-open impeller and the volute.

#### **PROTECTION**

Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection.

The thermal switches and float switch shall be connected to the existing Mini CAS control and status monitoring unit. **If pumps are supplied that will not operate with the existing monitoring unit, the pump supplier shall have an electrician approved by the City of Houston with the proper insurance and licenses, install the proper monitoring units at no cost to the City.**

#### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

#### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

#### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, WASTEWATER OPS/69TH ST WWTP, 2525 S / SGT. MACARIO GARCIA DRIVE, HOUSTON, TX 77020, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 19 - Pump, Submersible, Electric**

**Make: Flygt**

**Model: NP 3171X or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

Furnish **2** submersible non-clog wastewater pumps. Each pump shall be equipped with a **30 HP** submersible electric motor, connected for operation on **230/460 volts, 3 phase**, 60 hertz, **4** wire service, with 75 feet of submersible cable suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The pump shall be capable of operating with existing 6 inch discharge connections with no modification or extra cost to the City. **The pump shall be supplied with a drilled flanges and a stand for portable use. The pump shall be capable of delivering the design condition of 2400 GPM at 42 TDH.** The pump shall operate at the design condition with an efficiency of **80 %**. **The pump shall also be able to operate 3600 GPM at 20 feet total head with out vibration or cavitations. Shut off head shall be 82 feet (minimum).**

The pump must be able to be installed in dry pit application **with no modification and be rated for continuous duty in a completely dry environment.**

**PUMP DESIGN**

The pumps shall be capable of being used in a portable configuration or with a Flygt guide rail configuration with existing discharge connections.

**PUMP CONSTRUCTION**

Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts or bolts shall be of stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

### **COOLING SYSTEM**

Each unit shall be provided with an integral motor cooling system. A motor cooling jacket shall encircle the stator housing, **providing for dissipation of motor heat regardless of the type of pump installation.** An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the cooling jacket. The cooling system shall provide for continuous pump operation in liquid or ambient temperatures of up to 104°F. (40°C.). Operational restrictions at temperatures below 104°F are not acceptable. Fans, blowers or auxiliary cooling systems that are mounted external to the pump motor are not acceptable.

### **MOTOR**

The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant **Class H insulation** rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of pins, bolts, screws or other fastening devices used to locate or hold the stator and that penetrate the stator housing are not acceptable. The motor shall be designed for continuous duty while handling pumped media of up to 104°F. The motor shall be capable of withstanding at least 15 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of aluminum. Three thermal switches shall be embedded in the stator end coils, one per phase winding, to monitor the stator temperature. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the motor control panel.

**The junction chamber shall be sealed off from the stator housing and shall contain a terminal board for connection of power and pilot sensor cables using threaded compression type terminals. The use of wire nuts or crimp-type connectors is not acceptable. The motor and the pump shall be produced by the same manufacturer.**

The motor service factor (combined effect of voltage, frequency and specific gravity) shall be 1.15. The motor shall have a voltage tolerance of +/- 10%. The motor shall be designed for continuous operation in up to a 40°C. ambient and shall have a NEMA Class B maximum operating temperature rise of 80° C. A motor performance chart shall be provided upon request exhibiting curves for motor torque, current, power factor, input/output kW and efficiency. The chart shall also include data on motor starting and no-load characteristics.

Motor horsepower shall be sufficient so that the pump is non-overloading throughout its entire performance curve, from shut-off to run-out.

### **BEARINGS**

The integral pump/motor shaft shall rotate on two bearings. The motor bearings shall be sealed and permanently grease lubricated with high temperature grease. The upper motor bearing shall be a single ball type bearing to handle radial loads. The lower bearing shall be a two row angular contact ball bearing to handle the thrust and radial forces. The minimum L10 bearing life shall be **50,000 hours at any usable portion of the pump curve.**

### **MECHANICAL SEALS**

Each pump shall be provided with a positively driven dual, tandem mechanical shaft seal system consisting of two seal sets, each having an independent spring. The lower primary seal, located between the pump and seal chamber, shall contain one stationary and one positively driven rotating corrosion resistant **tungsten-carbide** ring. The upper secondary seal, located between the seal chamber and the seal inspection chamber, shall contain one stationary and one positively driven rotating corrosion resistant **tungsten-carbide** seal ring. All seal rings shall be individual solid sintered rings. Each seal interface shall be held in place by its own spring system. The seals shall not depend upon direction of rotation for sealing. Mounting of the lower seal on the impeller hub is not acceptable. Shaft seals without positively driven rotating members or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces are not acceptable. The seal springs shall be isolated from the pumped media to prevent materials from packing around them, limiting their performance.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and shall provide capacity for lubricant expansion. The seal lubricant chamber shall have one drain and one inspection plug that are accessible from the exterior of the motor unit. The seal system shall not rely upon the pumped media for lubrication.

The area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

A separate seal leakage chamber shall be provided so that any leakage that may occur past the upper, secondary mechanical seal will be captured prior to entry into the motor stator housing. Such seal leakage shall not contaminate the motor lower bearing. The leakage chamber shall be equipped with a float type switch that will signal if the chamber should reach 50% capacity.

#### **PUMP SHAFT**

The pump and motor shaft shall be a single piece unit. The pump shaft is an extension of the motor shaft. Shafts using mechanical couplings shall not be acceptable. The shaft shall be AISI type 431 stainless steel. Shaft sleeves will not be acceptable.

#### **IMPELLER**

The impeller shall be of gray cast iron, ASTM A-48 Class 35B, dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyl resin primer.

#### **VOLUTE/SUCTION COVER**

The pump volute shall be a single piece gray cast iron, ASTM A-48, Class 35B, non-concentric design with smooth passages of sufficient size to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified. The volute shall have integral spiral-shaped, sharp-edged groove(s) that is cast into the suction cover. The spiral groove(s) shall provide the sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The internal volute bottom shall provide effective sealing between the multi-vane semi-open impeller and the volute.

#### **PROTECTION**

Each pump motor stator shall incorporate three thermal switches, one per stator phase winding and be connected in series, to monitor the temperature of the motor. Should the thermal switches open, the motor shall stop and activate an alarm. A float switch shall be installed in the seal leakage chamber and will activate if leakage into the chamber reaches 50% chamber capacity, signaling the need to schedule an inspection.

The thermal switches and float switch shall be connected to the existing Mini CAS control and status monitoring unit. **If pumps are supplied that will not operate with the existing monitoring unit, the pump supplier shall have an electrician approved by the City of Houston with the proper insurance and licenses, install the proper monitoring units at no cost to the City.**

#### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

#### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's WASTEWATER OPS/69TH ST WWTP, 2525 S / SGT. MACARIO GARCIA DRIVE, HOUSTON, TX 77020, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 20 - Pump, Submersible, Mixer, Electric, Explosion Proof**

**Make: Flygt**

**Model: SR 4630 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Mixer, Electric, Explosion Proof**, for the **Northeast Treatment Plant**.

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

**Requirements:** The two (2) Mixing units must be able to fit a 2" Flygt guide rail system without modification or changes to the existing rail system.. Must be compatible to the existing units which are Flygt Model Stainless Steel SR 4630, electric submersible mixer complete with 2.5hp motor. Must be able to connect to existing electrical junction box without modifications to existing electrical junction box..

**Cable Entry:** Must consist of two compressible rubber bushings to seal off motor area and relieve strain on the cable.

**Junction Box:** Must be completely sealed off from surrounding liquid and stator casing via terminal board and an O-ring.

**Motor-** Squirrel cage, 3 phase induction shell type design or equivalent for the Mixer design. Motor must be able to run continuously **or intermittently**.

**Oil Casing-** Must come with environmentally friendly based oil and should be FDA approved and non-toxic. The lubricant should cool the seals and acts as an additional barrier to prevent liquid from penetrating the motor area. Must have a inner and outer oil compartment design which transports any foreign liquids away from rotating components.

**Bearings-** Must be designed or rated to run in excess of 100,000 hours of operation (B-10 rated life).

Shaft must be supported by a single row angular contact ball bearing and single row cylindrical roller bearing, plus a heavy duty single row angular contact ball bearing on the propeller side.

**Shaft-** Motor shaft and rotor should be a single integral unit. Shaft must be completely isolated and cannot come in contact with the mixed media.

**Active Shaft Seals-** Outer Mechanical seals must isolate the oil housing from being contaminated from the outer liquids. The inner seals must protect the stator from the oil in the oil housing from entering the motor.

**Propellar-** Must be 316 stainless steel or optional high chrome propeller. Propellers should be designed for optimum efficiency and non-clogging operations.

**Material Construction:** Outer housing of motor and components must be 304 or 316 Stainless Steel.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one year, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 21 - Pump, Submersible, Electric**

**Make: Flygt**

**Model: NP 3102X or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

Flygt pump  
4 inch discharge  
Head 100 feet  
5 hp.  
460 volts  
3 phase  
Model N- 3102

Explosion proof  
50 foot power cord  
ITT Water and Wastewater submersible use  
electric submersible  
60 Hertz

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 69<sup>th</sup> Street Wastewater Treatment Plant, 2525 S/SGT Macario Garcia, Houston, TX 77020, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Daffy Burroughs 832-341-7175.

**LINE ITEM NO. 22 PUMP, SPLIT CASE, NON-POTABLE WATER (BARE PUMP ONLY)**

**Make: ITT Goulds**

**Model: Model No. 3410 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirements for providing **Pump, Split Case** for the **Southwest WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is a city approved direct replacement of the ITT Goulds Model 3410 Split Case NPW Pump as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require replay an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**Design Requirements**

SIZE	4X6-13
GPM	600 GPM @ 147 Ft TDH Running
RPM	1775 RPM

The casing shall be horizontally split.

CAST IRON BRONZE FITTED w/BRONZE IMPELLER WEAR RINGS

420 Stainless Steel Shaft

316SS SHAFT SLEEVES

MECHANICAL SEALS

GREASE LUBE BEARINGS,

INPRO VBX BEARING SEALS,

TAPPED FLANGES FOR SUCTION/DISCHARGE GUAGE CONNECTIONS (SN#272C390)

**Delivery**

Entire assembled unit shall be delivered at COH's Cullen Maintenance Facility at 7440 Cullen, Houston, T 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Ray Belton (Phone # 713-562-4093).

### **Tools and Spare Parts**

(4) Operations and Maintenance manuals.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up whichever is less, and shall cover 100% of parts and labor for the unit.

Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect.

Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days.

**All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

**LINE ITEM NO. 23 PUMP, SPLIT CASE, NON-POTABLE WATER**

**Make: ITT Goulds**

**Model: Model No. 3410 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirements for providing **Pump, Split Case** for the **Southwest WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is a city approved direct replacement of the ITT Goulds Model 3410 Split Case NPW Pump as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require replay an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**Design Requirements**

SIZE	4X6-13
GPM	600 GPM @ 147 Ft TDH Running
RPM	1785 RPM

CAST IRON BRONZE FITTED w/BRONZE IMPELLER WEAR RINGS  
420SS SHAFT  
316SS SHAFT SLEEVES  
MECHANICAL SEALS  
GREASE LUBE BEARINGS  
INPRO VBX BEARING SEALS  
TAPPED FLANGES FOR SUCTION/DISCHARGE GUAGE CONNECTIONS  
40HP MOTOR w/1.15 SF, SEVERE DUTY/TEFC, 1800 RPM, 460V, FLEXIBLE COUPLING, COUPLING GUARD AND  
CAST IRON BASE PLATE

**Delivery**

Entire assembled unit shall be delivered at COH's Cullen Maintenance Facility at 7440 Cullen, Houston, T 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Aisha Niang (Phone # 832-395-5465)

### **Tools and Spare Parts**

(4) Operations and Maintenance manuals.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up whichever is less, and shall cover 100% of parts and labor for the unit.

Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect.

Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days.

**All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

**LINE ITEM NO. 24 - Pump, Self-priming, Centrifugal, Bare Pump**

**Make: ITT Goulds**

**Model: Trash Hog or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Self-priming, Centrifugal, Bare Pump**, for the **Sims Bayou North**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

**GENERAL**

Provide replacement solids-handling, self-priming centrifugal pumps, size 6x6-11 bare pump to match serial number 441A659.

**CASING**

The pump case shall be rugged, heavy duty cast iron Class 30 or better, with built-in cast iron volute. It shall have a 1½ inch (38mm) wing type filler plug for initial filling of pump case. The suction inlet flange shall be provided with a gauge tap to measure suction pressure before the check valve.

**IMPELLER**

The pump shall be provided with a semi-open, non-clog type, ductile iron impeller for solids handling capability. Pump-out vanes shall be integrally cast in the rear shroud to balance axial hydraulic thrust and reduce seal well pressure. It shall have a tapered bore for ease of removal and shall be keyed to the tapered shaft. Impeller shall be secured to the shaft with locknut and spring washer.

**SUCTION CHECK VALVE**

The pump shall be provided with a weighted elastomer, removable check valve. The check valve seat shall be no less than 12 degrees off the vertical plane to insure positive seating at minimum back pressure. The check valve shall be removable through a top access port without draining the pump casing (operator discretion required when handling harmful liquids) and without disturbing suction or discharge piping.

## **WEAR PLATE**

A replaceable cast iron wear plate shall be provided in front of the impeller and fitted to insure concentricity of wear plate opening and impeller eye. Wear plate clearance from the face of the impeller shall be measurable through the clean-out opening and externally adjustable without the use of shims and without disturbing a sealed interface on the casing.

## **CLEAN-OUT COVER**

The pump shall be equipped with a removable clean-out cover weighing no more than 8 pounds (3.64 kg). The cover shall be secured with two T handle nuts to permit removal without special tools. Cover plate shall be register fit such that the extended hub fills the port in the pump casing, providing a flush internal surface.

## **SHAFT**

The shaft shall be 17-4 PH stainless steel with a minimum tensile strength of 140,000 PSI and a minimum yield strength of 125,000 PSI. Maximum shaft deflection at mechanical seal face shall not exceed 0.002 inches (.050mm).

## **SHAFT SLEEVE (OPTIONAL)**

A shaft sleeve shall be required when operating under abrasive conditions, or when otherwise designated. The shaft sleeve shall extend from behind the impeller through the seal gland area and shall be of 416 stainless steel construction with an integral "O" ring seal between the sleeve and shaft to prevent leakage.

## **SHAFT SEAL**

The pump shall be equipped with a mechanical seal having silicon carbide rotating and stationary members. The bellows shall be of Buna "N" and the spring shall be of stainless steel. The seal shall be oil cooled and lubricated and installed within a separate oil filled reservoir between the seal plate and the bearing housing. The seal oil cavity shall be separated from the bearing cavity by a double lip-seal.

## **BEARINGS**

Heavy duty, oil lubricated, deep groove, ball bearings shall be provided. Bearings shall be of adequate size to handle all conditions of loading without requiring external cooling.

## **BEARING FRAME**

Bearing housing shall be cartridge style, line bored, cast iron arranged for oil lubrication. Outboard double lip seals shall be provided to seal the oil cavity and prevent intrusion of foreign matter. Housing shall include top vent, bottom drain and oil fill connections on both left and right side. Rear bearing shall be fixed mounted in an axially adjustable bearing carrier to permit adjustment of impeller to wear plate clearance through movement of the shaft assembly. Infinite variation shall be provided by means of jack screws. Bearing frames that require the addition or removal of interior or exterior shims, for clearance adjustment, shall not be acceptable.

## **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

## **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

## **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 25 - Pump, Dry Pit**

**Make: A-C**

**Model: 200 NSWV or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Dry Pit**, for the **Dockal F/N: 054 Lift Station** .

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The dry pit pump will be used to lift raw sewage water from wet wellt o receiving wastewater treatment plant at the Dockal Lift Station, F/N: 054.

Dry-Pit Pump  
SZ 8X8X17 SC

**CASING:** Pump castings shall be cast iron conforming to ASTM A48 Class 30 ductile iron or better. Thickness and weight shall insure long life, accurate alignment and reliable operation. Casing shall be designed to allow removal of rotating elements without disturbing piping connections.

**IMPELLERS:** The pump impeller shall be non-clog designed with smooth passage to pass liquid and prevent clogging of stringy fibrous material. The impeller material type made of cast iron conforming to ASTM A48 Class 30 cast iron. Impeller shall be statistically and dynamically balanced. Impeller fastener shall be stainless steel.

**WEAR RINGS:** Shall be furnished with the impeller and case wear ring and must be fully adjustable and replaceable. Wear rings shall be constructed of stainless steel with a BHN of 300-350.

**BEARINGS:** The minimum  $L_{10}$  bearing life shall be 50,000 hours at the best efficiency point. Bearing shall be properly sized to accommodate all, mechanical and hydraulic thrusts.

SHAFT SLEEVE: Shaft shall be constructed of stainless steel with a BHN of 410-484. Shaft shall be designed of sufficient size to transmit the maximum horsepower and at maximum rated motor operating speed. . It shall be protected from the pump liquid by shaft sleeve in the stuffing box area.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of (1) year warranty from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Mr. Richard Bellinger, WWTP Maintenance, Operations Branch, 7440 Cullen, Houston, Texas 77051 ( Phone # 713-591-8663 or 832-395-3535).

**LINE ITEM NO. 26 and 27 - Pump, Dry Pit / Pump, Parts, Impeller**

**Make: A-C**

**Model: 250 NSWV / 52-431-509-050 or 52-431-510-050 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Dry Pit / Pump, Parts, Impeller**, for the **Clinton Park Main Lift Pumps**.

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The City of Houston intends to purchase one (1) Complete pump Assembly and two (2) spare impellers for the pumps at the Lift Station at Clinton Park T.P. The pump and Impellers must fit the existing A/C Model 250 (as mentioned above) and existing volutes. Pumps shall be capable of handling untreated wastewater containing solids up to 4" diameter. The pump shall be centrifugal, single stage, end suction/ radial discharge type with centerline discharge. The pump shall be designed such that the entire rotating assembly can be pulled out and removed without disturbing the suction and discharge.

**Requirements for providing Dry Pit Sewage Pump**

**General:** The Pump must be same or equivalent to the existing pumps at the lift station. Must be able to install in current positions without modifications to existing piping. Impellers must fit existing pumps already in service.

**Performance:**

Impeller Size- 8X8X14

Minimum free solids passage- 4" diameter

Minimum shut off head.- 45ft.

Maximum Motor H.P.- 60hp

Maximum Pump/Motor speed- 1800 RPM

Minimum Hydraulic Efficiency (at design)- 75%

**Pump Construction:** Pump volute shall be constructed of material that will be able to completely withstand all hazards associated with operating continuously or intermittently in typical wastewater environment, without malfunction, for long periods of time.

**Impeller:** On pump as well as spares shall be designed to be capable of passing small solids and stringy materials. Impellers shall be dynamically balanced. Spare Impellers should be capable of being installed or fit on existing pumps at the plant already in service. Impellers should have stainless steel wear rings mounted to them. Impellers shall be of a quality bronze or equivalent material to withstand wear associated with untreated waste water.

**Shaft:** Pump shaft shall be high strength carbon steel or a equivalent material, AISI #1140 or #4140, accurately machined and of sufficient size to transmit full drive output. It shall be protected from the pumped liquid by a shaft sleeve.

**Shaft Sleeve:** Shall be of a high strength Stainless Steel that can withstand abrasive from the pumped waste water to prevent the minimal amount of wear on the sleeve.

**Stuffing Box-** The pump shall be provided with a packed stuffing box. Box and cover shall be made of cast iron. Stuffing box shall contain the required amount of packing and lantern ring. Gland shall be split or an easy type to permit easy access and removal.

**Bearing Frame:** Pump bearing frame shall be rigid cast iron construction. Both ends of the frame shall be provided lip type grease seals and labyrinth type deflectors to prevent entrance of contaminants.

**Bearings:** Shall be designed or suitable for all loads encountered in the service condition. Bearing shall be greased lubricated with provisions for addition and relief of grease.

### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one year, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 28 - Pump, 6" Double Disk - Sludge Feed Pump**

**Make: Penn Valley**

**Model: 6DDSX76 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, 6" Double Disk - Sludge Feed Pump**, for the **Sims North WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to transfer digested sludge in the sludge removal process.

**Pump:**

Belt Filter Press Feed, 200 GPM @ 40'TDH  
Model 6DDSX76,6-inch Double Disc Sludge Transfer Pump  
Pump :  
6-inch Double Disc Pump, Model 6DDSX76  
Pump Capacity (Maximum): 200 gpm @ 40 ft. TDH  
Pump Capacity (Minimum): 50 gpm @ 40 ft. TDH  
Maximum Discharge Head in feet: 140 TDH  
Maximum Pump speed: 200 RPM  
Pump suction and discharge size: 6"  
Solid percentage handling: 1.5 – 4%  
Spare Parts, including Disc Removal Tool

**Motor:**

Variable speed drive  
Maximum Motor Speed: 1200 RPM  
Motor Horse Power: 15 HP  
Service factor: 1.15

Voltage: 230 – 460 Volts, 3 Phase, 60 Hertz  
Power Factor: 82% @ 100 % full Load  
Efficiency: 92.4 % @ 100% full speed  
Encl.: TEFC, Premium Efficiency Severe Duty

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

Tools and spare parts for at least one year, including the Disc Removal Tool.

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

The equipment shall be warranted for a period of two (2) year against defects in workmanship and materials under normal use, operation and service. If the equipment should fail during the warranty period due to a defective part, it shall be replaced and the units restored at no expense to the owner. Should the Manufacturer's warranty exceed these requirements; the Manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable period, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd, Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must also coordinate with the appropriate City of Houston Receiving Staff at Cullen Service Center, to ensure that the unit is off-loaded safely in the appropriate place and in the manner desired by the City of Houston.

Final Delivery details should also be coordinated with Mr. Ray Belton, Wastewater Operations Branch, (Phone # 713-562-4093).

**LINE ITEM NO. 29 - Pump, 6" Double Disk**

**Make: Penn Valley**

**Model: 6DDX107 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, 6" Double Disk**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

Centrifuge Feed, 120 GPH @ 40-50ft TDH  
Typical Flow Range: Up to 600GPM  
Displacement: 1.7 gal/rev @ 60ft TDH @ 300RPM  
Operating Speeds: Up to 500 RPM  
Discharge Pressure: Up to 60psi operating, Up to 110psi stall pressure  
Suction Pressure: Up to 25"Hg (28ft)  
Connections: 6" 150# Flanged

**Materials of Construction:**

Housings: Cast Iron  
Elastomers: Neoprene  
Connecting Rods: High-tensile Aluminum  
Drive Shaft: High-tensile 400 Series SS  
Eccentric Cams: High-tensile bronze-alloy  
Bearing Pedestals: Aluminum  
Frame and Covers: 304SS

**DRIVERS:**

Static: Electric belt and pulley  
Trailer Mounted: Electric, Gas and Diesel engine

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide (1) one day start-up services and freight to jobsite.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

Set of Recommended Spare Parts:

(2) Universal Discs, Neoprene

(2) Trunnion Seals, Neoprene

(1) Complete Set of Gaskets

(1) Clack Valve

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of (2) years for defects and workmanship, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's DRINKING WATER OPS/EW PURIF PLANT, 2300 FEDERAL RD., Houston, TX 77015, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with the COH contact person listed on the Purchase Order.

**LINE ITEM NO. 30 - Self Priming Pump**

**Make: Gorman Rupp**

**Model: T6A3-B/F or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Self Priming Pump**, for the **Sims Bayou South**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The self-priming pump is to be used to pump waste activated and thickened sludge. These specifications are for pump, rotating assembly, baseplate, coupling and guard.

Operating Flow (Required)	200-400 GPM @47 feet TDH
Maximum NPSH <sub>R</sub>	4.2 Feet
Suction Size	6 inch
Discharge size	6 inch
Horsepower and Speed	15 HP, 1750 RPM
Voltage	230V/460 V pre-wired 460V
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION.	

**Equipment and performance**

CASING and COVERPLATE: Pump castings and coverplate shall be cast iron class 30 or better. Thickness and weight shall insure long life, accurate alignment and reliable operation. Volute shall be designed to be smooth and free of blowholes and imperfections. Volute shall be designed to ensure passage of waste solids.

IMPELLERS: The pump impeller shall be of cast iron. Impeller shall be semi-open type, non-clog and designed with smooth passage to pass waste solids at heavy consistency such as waste activated sludge and thickened sludge. Impeller shall also be able to withstand solids, fibrous material, wastewater sludge and other material present in wastewater. Rotation of the impeller shall be secured via a lockscrew and conical washer.

**BEARINGS AND SHAFT:** Bearings shall be if cast iron class 30 or better. Bearing cavity shall have an oil level sight gauge and fill plug check valve. The sight class shall provide east monitoring of the bearing cavity oil level and condition of oil without removal if the fill plug check valve. The bearing shall be rated in accordance with Anti-Friction Bearing Manufacturers Association for a minimum L<sub>10</sub> bearing life of 100,000 hours at the best efficiency point. Bearings shall be suitable for all radial loads and axial load .Shaft shall be AISI 4140 alloy steel. Shaft shall be closed coupled directly to the pump shaft is using a solid sleeve coupling.

**MOTOR:** The frequency of the motor shall be 60 hertz and winding shall be insulation class F or better. Motor must be designed specifically for pump usage (water tight). Motor shall be non-overloading for the entire range of the operating curve within the name plate and shall be capable of no less than 10 evenly spaced starts per hour. Motor shall be rated for continuous on in air operation. A performance chart shall be provided showing curves.

**SEAL:** Each pump shall be provided with a tandem mechanical shaft seal system. The seal shall contain silicon-carbide faces .The upper seal set shall function as an independent secondary barrier between the pumped liquid and the stator housing. The lower seal shall be exposed to the lubricant in the bearing housing with no exposure to the pumpage. Seals shall rest on a 316 stainless steel shaft sleeve with seal tension held by 3 set screws.

**PROTECTION:** Thermal sensors shall be used to monitor stator temperatures. The stator shall be equipped in the end of the coils of the stator winding .These shall be used in conjunction with and supplemental to external motor overload protection and wired to the control panel. The pump shall be equipped with moisture sensors in the oil filled seal chamber to indicate seal leakage. Surface material is to be sandblasted and finished coated with epoxy.

**RE-PRIME:** During operation, pump shall retain adequate liquid in the casing to ensure automatic re-priming while operating at its rated speed in a completely open system. The need for a suction or external priming device shall not be required. The pump must re-prime and deliver fill capacity within five minutes after five minutes after pump is energized.

### **Delivery**

Entire assembled unit shall be delivered at COH's, Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with the COH contact listed on the Purchase Order.

### **Tools and Spare Parts**

(4) O&M (Operations and Maintenance manuals).

### **Warranty**

The manufacturer shall provide the following to the owner:

One (1) year warranty from the date of final system acceptance.

Components failing to perform as specified by the engineer or City of Houston representative shall be replaced, repaired, or satisfactorily modified by the supplier without cost of parts or labor to the owner.

### **Manufacturers/Vendor Services**

The manufacturer shall furnish the services of (a) competent factory representative(s) to do the following upon request:

Provide complete training and local service capability for a period of not less than one half day.

Be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**LINE ITEM NO. 31 - Self Priming Pump**

**Make: Gorman Rupp**

**Model: T6A3S-B/F or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Self Priming Pump**, for the **Sims Bayou South**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The self-priming pump is to be used to pump waste activated and thickened sludge. These specifications are for pump, rotating assembly, baseplate, coupling and guard.

Operating Flow (Required)	200-400 GPM @47 feet TDH
Maximum NPSH <sub>R</sub>	4.2 Feet
Suction Size	6 inch
Discharge size	6 inch
Horsepower and Speed	15 HP, 1800 RPM
Voltage	240V/480 V pre-wired 460V
Motor	1800 RPM, TEFC Motor
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION.	

**Equipment and performance**

CASING and COVERPLATE: Pump castings and cover plate shall be cast iron class 30 or better. Thickness and weight shall insure long life, accurate alignment and reliable operation. Volute shall be designed to be smooth and free of blowholes and imperfections. Volute shall be designed to ensure passage of waste solids.

IMPELLERS: The pump impeller shall be of cast iron. Impeller shall be semi-open type, non-clog and designed with smooth passage to pass waste solids at heavy consistency such as waste activated sludge and thickened sludge.

Impeller shall also be able to withstand solids, fibrous material, wastewater sludge and other material present in wastewater. Rotation of the impeller shall be secured via a lock screw and conical washer.

**BEARINGS AND SHAFT:** Bearings shall be if cast iron class 30 or better. Bearing cavity shall have an oil level sight gauge and fill plug check valve. The sight class shall provide east monitoring of the bearing cavity oil level and condition of oil without removal if the fill plug check valve. The bearing shall be rated in accordance with Anti-Friction Bearing Manufacturers Association for a minimum L10 bearing life of 100,000 hours at the best efficiency point. Bearings shall be suitable for all radial loads and axial load .Shaft shall be AISI 4140 alloy steel. Shaft shall be closed coupled directly to the pump shaft is using a solid sleeve coupling.

**MOTOR:** The frequency of the motor shall be 60 hertz and winding shall be insulation class F or better. Motor must be designed specifically for pump usage (water tight). Motor shall be non-overloading for the entire range of the operating curve within the name plate and shall be capable of no less than 10 evenly spaced starts per hour. Motor shall be rated for continuous on in air operation. A performance chart shall be provided showing curves.

**SEAL:** Each pump shall be provided with a tandem mechanical shaft seal system. The seal shall contain silicon-carbide faces .The upper seal set shall function as an independent secondary barrier between the pumped liquid and the stator housing. The lower seal shall be exposed to the lubricant in the bearing housing with no exposure to the pumpage. Seals shall rest on a 316 stainless steel shaft sleeve with seal tension held by 3 set screws.

**PROTECTION:** Thermal sensors shall be used to monitor stator temperatures. The stator shall be equipped in the end of the coils of the stator winding .These shall be used in conjunction with and supplemental to external motor overload protection and wired to the control panel. The pump shall be equipped with moisture sensors in the oil filled seal chamber to indicate seal leakage. Surface material is to be sandblasted and finished coated with epoxy.

**RE-PRIME:** During operation, pump shall retain adequate liquid in the casing to ensure automatic re-priming while operating at its rated speed in a completely open system. The need for a suction or external priming device shall not be required. The pump must re-prime and deliver fill capacity within five minutes after five minutes after pump is energized.

### **Delivery**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with the COH contact listed on the Purchase Order.

### **Tools and Spare Parts**

(4) O&M (Operations and Maintenance manuals).

### **Warranty**

The manufacturer shall provide the following to the owner:

One (1) year warranty from the date of final system acceptance.

Components failing to perform as specified by the engineer or City of Houston representative shall be replaced, repaired, or satisfactorily modified by the supplier without cost of parts or labor to the owner.

### **Manufacturers/Vendor Services**

The manufacturer shall furnish the services of (a) competent factory representative(s) to do the following upon request:

Provide complete training and local service capability for a period of not less than one half day.

Be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance

**LINE ITEM NO. 32 - Pump, Vertical Pedestal Mounted Solids Handling Wastewater**

**Make: Chicago Yeoman**

**Model: VPM-OCL10 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Vertical Pedestal Mounted Solids Handling Wastewater**, for the **Upper Braes WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

VERTICAL PEDESTAL MOUNTED SOLIDS HANDLING WASTEWATER PUMP  
3125 GPM at 30' TDH - 870 RPM, 15 1/2" IMPELLER DIAMeter  
10" DISCHARGE, 10" SUCTION,  
480V motor  
SEVERE DUTY, CORRO-DUTY  
INVERTER RATED  
CLASS F INSULATION  
870 RPM  
120V, 200 WATT SPACE HEATERS

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

## **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

## **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with the COH contact listed on the Purchase Order.

**LINE ITEM NO. 33 - Pump, Submersible**

**Make: Yeoman**

**Model: 4315SC-3D or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to pump sludge in the plant from the thickener clarifiers to the DSP pumps.

Horizontal Coupled pump  
Model 4315SC – 3D HBB  
4 inch suction 4 inch discharge  
hp. Driven 7.5 hp. motor  
Serial # 7517001289  
GPM 400, Head 35

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's 69<sup>th</sup> Street Wastewater Treatment Plant, 2525 S/SGT Macario Garcia, Houston, TX 77020, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Daffy Burroughs 832-341-7175.

**LINE ITEM NO. 34 - Pump, Motor**

**Make: Yeoman**

**Model: TEFC256T or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Motor**, for the 69<sup>th</sup> Street WWTP.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump motor specified here will be used to pump sludge in the plant from the thickener clarifiers to the DSP pumps.

Electric Motor  
Squirrel Cage rotor  
Aluminum Die Cast  
7.5 hp.  
460 volts  
3 phase  
Model: 12717249-100

NIDEC Motor Corporation  
ID # 12717249-0001 H 0003  
Totally enclosed fan cooled  
TEFC (IP55) water tight and dust tight  
Electrical : 104 degree F ( 40 degree C ) ambient temperture  
RPM 885 Frame: 256T  
60 Hertz  
Literature/ Manuals  
Warranty

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's 69<sup>th</sup> Street Wastewater Treatment Plant, 2525 S/SGT Macario Garcia, Houston, TX 77020, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 35 - Pump, Submersible**

**Make: Yeoman**

**Model: CP 2111, 6415-4A, HBB or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to pump sludge in the plant from the thickener clarifiers to the DSP pumps.

Horizontal Coupled pump  
Model: CP21116415 – 4A, HBB  
6 inch suction 4 inch discharge  
hp. Driven 15 hp. motor  
7517000097  
GPM 400 Head 35  
RPM 400

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

## **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

## **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's 69<sup>th</sup> Street Wastewater Treatment Plant, 2525 S/SGT Macario Garcia, Houston, TX 77020, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Daffy Burroughs 832-341-7175.

**LINE ITEM NO. 36 - Pump, Motor**

**Make: Yeoman**

**Model: TEFC286T or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Motor**, for the 69<sup>th</sup> Street WWTP.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump motor specified here will be used to pump sludge in the plant from the thickener clarifiers to the DSP pumps.

Electric Motor  
Squirrel Cage rotor  
Aluminum Die Cast  
15 hp.  
460 volts  
3 phase  
Model: 11568843

NEMA Efficiency Motor  
Item # 01509ET3E286T - W22  
Totally enclosed fan cooled  
TEFC (IP55) water tight and dust tight  
Electrical : 104 degree F ( 40 degree C ) ambient temperture  
RPM 880 Frame: 286T  
60 Hertz

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's 69<sup>th</sup> Street Wastewater Treatment Plant, 2525 S/SGT Macario Garcia, Houston, TX 77020, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 37 - Pump, Double Suction Horizontal Split Case, Centrifugal**

**Make: PACO**

**Model: KP 3095 7/8 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Double Suction Horizontal Split Case, Centrifugal**, for the **Sims North WWTP**.

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to supply non-potable water throughout the plant.

**Pump:**

Double suction horizontal split case centrifugal pump (s), or equal, designed to deliver the scheduled flow rate (in GPM), the specified total dynamic head (in feet), at the scheduled efficiency and scheduled speed (RPM). OPTION: (The pumps shall also be NSF-50 and NSF-61 certified.) 378 GPM, 90.8 TDH, 3545 RPM.

**Motor:**

15HP 230/460/3/60 1800 RPM TEFC Premium

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 39 - 10" Vertical Non-Clog Sewage Pump**

**Make: Fairbanks Morse**

**Model: C5415 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **10" Vertical Non-Clog Sewage Pump**, for the **Southeast WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to lift raw sewage from the lift station wet well to the treatment process.

**Pump:**

10" VERTICAL NON-CLOG SEWAGE PUMP  
T60 BEARING FRAME w/CAST IRON IMPELLER  
DYNAMICALLY BALANCE IMPELLER  
STAINLESS STEEL IMPELLER AND CASE WEAR RINGS:300-350 BHN  
STAINLESS STEEL SHAFT SLEEVE:410-484 BHN  
STAINLESS STEEL IMPELLER FASTENER  
OPERATING FLOW (Required): 4,000 GPM @ 45 ft. TDH  
DISCHARGE SIZE: 10 in  
SOLID DIAMETER: 3 IN  
TYPE OF SEAL: Standard Packing  
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of (a) competent factory representative(s) to do the following upon request:

Provide complete training and local service capability for a period of not less than one half day.

Be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 1 year from the date of final acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

Components failing to perform as specified by the engineer or City of Houston representative shall be replaced, repaired, or satisfactorily modified by the supplier without cost of parts or labor to the owner.

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Mr. Ray Belton, WWTP Maintenance, Operations Branch, 7440 Cullen, Houston, Texas 77051 ( Phone # 713-562-4093).

**LINE ITEM NO. 40 - Pump, Submersible**

**Make: Fairbanks Morse**

**Model: D5731SMV or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible**, for the **West District WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The dry pit pump to pump raw unscreened sewage at West District WWTP Lift Pump Station (FN 237). Specification is for pump only.

OPERATING FLOW (Required)	12,000 GPM @ 32.5 ft. TDH
DISCHARGE SIZE	20 in
SOLID DIAMETER	7.5 IN
TYPE OF SEAL	Mechanical Seal
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION	

CASING: Pump castings shall be cast iron conforming to ASTM A48 Class 30 ductile iron or better. Thickness and weight shall insure long life, accurate alignment and reliable operation. Casing shall be designed to allow removal of rotating elements without disturbing piping connections.

IMPELLERS: The pump impeller shall be non-clog designed with smooth passage to pass liquid and prevent clogging of stringy fibrous material. The impeller material type made of cast iron conforming to ASTM A48 Class 30 cast iron. Impeller shall be statistically and dynamically balanced. Impeller fastener shall be stainless steel.

WEAR RINGS: Shall be furnished with the impeller and case wear ring and must be fully adjustable and replaceable. Wear rings shall be constructed of stainless steel with a BHN of 300-350.

**BEARINGS:** The minimum  $L_{10}$  bearing life shall be 50,000 hours at the best efficiency point. Bearing shall be properly sized to accommodate all, mechanical and hydraulic thrusts.

**SHAFT SLEEVE:** Shaft shall be constructed of stainless steel with a BHN of 410-484. Shaft shall be designed of sufficient size to transmit the maximum horsepower and at maximum rated motor operating speed. . It shall be protected from the pump liquid by shaft sleeve in the stuffing box area.

### **Delivery**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Stephen Hooks, WWTP Maintenance, Operations Branch, 7440 Cullen, Houston, Texas 77051 ( Phone # 281-960-7513 ).

### **Tools and Spare Parts**

(4) Operations and Maintenance manuals.

### **Warranty**

The manufacturer shall furnish the following to the owner:

Shall provide one (1) year warranty from the date of final system acceptance.

Components failing to perform as specified by the engineer or City of Houston representative shall be replaced, repaired, or satisfactorily modified by the supplier without cost of parts or labor to the owner.

### **Manufacturers/Vendor Services**

The manufacturer shall furnish the services of (a) competent factory representative(s) to do the following upon request:

Provide complete training and local service capability for a period of not less than one half day.

Be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**LINE ITEM NO. 41 - Pump, Submersible, Dry Pit**

**Make: Fairbanks Morse**

**Model: B5414 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Dry Pit.**

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The Pump must fit with none or minimum modifications to existing piping.

Pump must be compatible to existing pump.

-Impeller - Cast Iron Impeller, Dynamically Balanced S.S. Impeller fastener

-Wear Rings- 416 hardened wear rings 300-350 BHN

-Sleeve-420 SS shaft sleeve to 410-484 BHN

-Stuffing box with Packing

-Pump must meet these specifications (sewage)

-Design Conditions

-1575 GPM @43.75 ft. TDH at 1160 RPM

-500 GPM @30.5 ft. TDH at 870 RPM

All pumping equipment furnished under this Section shall be of a design and manufacture that has been used in similar applications and it shall be demonstrated to the satisfaction of the Owner that the quality is equal to equipment made by that manufacturer specifically named herein.

Unit responsibility - Pump(s), complete with motor, intermediate shafting, necessary guards and all other specified accessories and appurtenances shall be furnished by the pump manufacturer to insure compatibility and integrity of the individual components, and provide the specified warranty for all components.

The vertical dry-pit solids-handling pump(s) specified in this section shall be furnished by and be the product of one manufacturer.

Pumps are to be engineered and manufactured under a written Quality Assurance program. The Quality Assurance program is to be in effect for at least ten years, to include a written record of periodic internal and external audits to confirm compliance with such program.

Pump(s) are to be engineered and manufactured under the certification of ISO-9001:2000.

**PERFORMANCE**

The pump(s) shall be designed for continuous operation and will be operated continuously under normal service.

**OPERATION CRITERIA**

	Flow (GPM)	TDH (ft.)	Max. Pump Speed (RPM)	Max. Solids Passage
Design Condition	2500	40ft	1185	3"

Liquid pumped is raw wastewater

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one year upon installation, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 42 - Pump, Motor**

**Make: Fairbank Morse**

**Model: Nidec or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Motor**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

**Premium Efficiency motor**

**40hp Motor for the lift pumps**

Dual speed vertical solid shaft

1200/900 RPM, 480/3/60, Frame 404HP, Type-HGV, Amps-49-39

Must fit or seat exact for existing motor stand. (If needed will take bidder out to plant to see motor needed.)

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one year upon installation, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 43 PUMP, HEAVY DUTY ELECTRIC, SKID MOUNTED W/1 MANUAL CONTROL PANEL**

**Make: Godwin**

**Model: No. CD-103M or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirements for providing **electrically driven trash pump** for **Sims North WWTP**

The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is a city approved substitute to a Godwin, CD103M, 4" x 4" pump as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require a reply with an explanation at each deviation or substitution

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

OPERATING SPEED (MAX):	1780 RPM
MAXIMUM SUCTION LIFT	28 FEET
SUCTION SIZE	4 in
DISCHARGE SIZE	4 in
IMPELLER DIAMETER:	256 mm
MINIMUM SOLIDS HANDLING SIZE:	3 in
MAXIMUM SUCTION LIFT	28 FEET
MAXIMUM DUTY POINT:	700 GPM @ 65 ft. TDH
	INCLUDING A 15' SUCTION LIFT)
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION	

**REFERENCES**

ANSI B16.1 - Standard for Cast Iron Pipe Flanges and Flanged Fittings.

The electrically driven trash pump for Sims North WWTP is to be used to pump sludge to the CHT tank that feeds the Beltpress

**Equipment**

**CASING:** Pump castings shall be cast iron. Thickness and weight shall insure long life, accurate alignment and reliable operation in the wastewater environment.

**IMPELLERS:** The pump impeller shall be of open non-clog designed with smooth passage to pass liquid and prevent clogging of stringy fibrous material. The impeller shall be made of chromium steel with a minimum Brinell Hardness 340 HB.

**WEARPLATES:** Shall be fully adjustable and replaceable. Wear plate clearance shall have no effect on the priming ability of the pump.

**BEARINGS AND IMPELLER SHAFT:** The minimum  $L_{10}$  bearing life shall be 100,000 hours at the best efficiency point. Bearings shall be properly sized to withstand all imposed loads. Impeller shaft shall be of 1.5% chromium steel.

**SEALS:** Seals shall be high pressure, mechanical self-adjusting type with silicon carbide faces capable of withstanding suction pressures of 88 psi. The seal shall be cooled and lubricated in an oil bath reservoir, requiring no maintenance or adjustments. All metal parts shall be stainless steel.

**MOTOR and MOTOR CONTROL:** Shall be a totally enclosed, fan cooled (TEFC), 30 Horsepower electric motor. Motor shall be inverter duty motor with a minimum insulation class H. Motor shall be rated for 30 HP at a nominal speed of 1800 RPM. Motor shall have cast iron housing, connection box and fan cover. Motor shaft shall be of high strength steel, grade 4140. Pump shall be directly coupled to the motor. Pump and motor shall be connected by means of flexible coupling and secure to shaft with taper lock bushings. Motor shall have a NEMA 3R enclosure rated for outdoor use. Enclosure shall house the motor contactor and the main circuit breaker with a through door handle. Enclosure shall have terminal lugs for line power feed, motor lead connections and line reactor. Motor control shall have a 120 volt control circuit that shall include H-O-A switch to select manual or automatic operation, start and stop push buttons, terminals for remote start-stop operation, pump running and pump fault. The motor control box shall also have a provision for a 4-20 milliamp loop to accommodate two float assembly. Pump and motor shall be mounted on a grout ready skid.

**DISCHARGE AND SUCTION FLANGES:** Shall be cast iron ANSI class 150 or better. Two 4"x 6" eccentric increasers shall be provided. Pump shall be provided with an integral check valve mounted on the discharge flange of the pump to allow unrestricted flow to the impeller but prevent return of flow when pump is shut-off.

**PRIMING:** Pump shall be fitted with a fully automatic priming system incorporating an air compressor, air ejector assembly, and an air/water separation tank. No water shall be requires to achieve a prime. The air ejector shall operate on the discharge side of the compressor, eliminating the possibility of water being drawn into the air source. The priming system shall not use a vacuum or diaphragm pump, nor require the use of "Foot" type valve. It shall contain no moving parts or protective float gear. Pump to be fully automatic, needing no form of adjustment on priming system. The pump shall be capable of static suction lifts to 8 feet, vertical, at sea level. It shall be capable of operation using extended suction lines.

**PERFORMANCE AND ENVIRONMENT:** Pump, motor and cable shall be designed for continuous dry conditions with no damage for periods up to 24 hours. Pump shall be able to withstand the wastewater environment. Pump, electric motor, and base shall be shop primed and finish painted at the place of manufacturer.

### **Delivery**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7400 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Vendor shall be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Final Delivery details should also be coordinated with Aisha Niang, Engineer 832-395-5465.

### **Tools and Spare Parts**

Four (4) Operations and Maintenance manuals.

### **Warranty**

The manufacturer shall furnish the following to the owner:

Shall provide one (1) year warranty from the date of final system acceptance.

**Manufacturers/Vendor Services**

The manufacturer shall furnish the services of (a) competent factory representative(s) to do the following upon request:

Provide complete training and local service capability for a period of not less than one half day.

Be present during installation and/or start-up of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and test and certify the system has been properly furnished and is ready for operation.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**LINE ITEM NO. 44 PUMP, 4" PORTABLE TRAILER MOUNTED TRASH PUMP IN A CRITICALLY SILENCED ENCLOSURE**

**Make: Godwin**

**Model: No. NC100 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirements for providing Trailer Mounted Trash Pump in a Critically Silenced Enclosure.

GENERAL. The specifications herein state the minimum requirements of the City of Houston. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The city may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the City of Houston to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification. Failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected, without review, as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section. Deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the specified quantity (x) year Godwin Dri-Prime® NC100 (4") 4 inch, trailer mounted pump or equal, as interpreted by the City of Houston. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the City of Houston. Based upon such inquiry, the City of Houston may choose to issue an Addendum in accordance with local public contract laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the City of Houston, must be prepared to review their specifications with the City of Houston and must, if requested, also be prepared to provide a unit for the convenience of the City of Houston. These services, if needed, are considered as part of the bidder's proposal and will be provided without cost or obligation to the City of Houston.

**SYSTEM DESCRIPTION**

These pumps will be utilized for emergency pumping at wastewater treatment plants and off site lift stations.

Pump shall be fitted with a fully automatic priming system capable of repeated priming from a completely dry pump casing.

The pump, diesel engine and accessories shall be supplied by the pump manufacturer.

**DESIGN REQUIREMENTS**

CRITCALLY SILENCED PUMP

SOUND ATTENUATED ENCLOSURE

4" 150# FLANGE SUCTION AND DISCHARGE

YANMAR 3TNV88C FT4 DIESEL ENGINE

TO INCLUDE PRIMEGUARD ENGINE CONTROLLER

PUMPS SHALL BE SKID MOUNTED WITH SKIDS THEN MOUNTED ON A TRAILER

OPERATING SPEED (MAXIMUM)	2200 RPM
IMPELLER DIAMETER	10.1 INCHES
SUCTION SIZE	4 INCHES
DISCHARGE SIZE	4 INCHES
MAXIMUM SUCTION LIFT	28 FEET
MAXIMUM DUTY POINT	900 GPM AT 62'TDH (INCLUDING A 15' SUCTION LIFT)
MAXIMUM SHUTOFF HEAD	165 FEET

## **REFERENCES**

ANSI B16.1 - Standard for Cast Iron Pipe Flanges and Flanged Fittings.

## **ACCEPTABLE MANUFACTURERS**

The pump shall be a Model NC100, size 4" x 4" as manufactured by GODWIN PUMPS, Bridgeport, New Jersey.

## **EQUIPMENT**

**CASING, SUCTION COVER, SEPARATION TANK:** Pump castings shall be cast iron. Pump design shall incorporate a direct suction flow path that is in axial alignment with the impeller eye. There shall be no turns, chambers, or valves between the suction flange and the impeller eye.

**IMPELLER:** The impeller shall be of (ASTM A-48, Class 35B grey cast iron or ASTM A-532 (Alloy III A) 25% chrome cast iron), dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer

**WEARPLATES:** Shall be fully adjustable and replaceable, fabricated of cast iron. Wear plate clearances shall have no relationship to the ability of the pump to achieve a prime. The front or inlet wear plate shall be a replaceable inert ring with a cast spiral-shaped, sharp-edged groove(s). The spiral groove(s) shall provide trash release pathways and sharp edge(s) across which each impeller vane leading edge shall cross during rotation so to remain unobstructed. The insert ring shall be cast of (ASTM A-48, Class 35B grey cast iron or ASTM A-532 (Alloy III A) 25% chrome cast iron) and shall provide effective sealing between the multi-vane semi-open impeller and the volute.

**BEARINGS AND SHAFTS:** Pump shall be fitted with a bearing bracket to contain the shaft and bearings. Bearings shall be tapered roller bearings of adequate size to withstand imposed loads for sustained pumping at maximum duty points. Minimum ISO L10 bearing life to be 100,000 hours. Impeller shafts shall be fabricated of 1.5% chromium alloy.

**SEALS:** Seal shall be high pressure, mechanical self-adjusting type with silicon carbide faces capable of withstanding 26" hg vacuum and suction pressures to 58 psi. The mechanical seal shall be cooled and lubricated in an oil bath reservoir, requiring no maintenance or adjustment. Pump shall be capable of running dry, with no damage, for periods up to twenty-four hours. All metal parts shall be of stainless steel. Elastomers shall be Viton.

**PUMP SUCTION AND DISCHARGE FLANGES:** Shall be cast iron ANSI (B16.1) Class 125, raised faced.

**PUMP GASKETS:** Shall be compressed fiber and/or Teflon.

**PUMP O RINGS:** Shall be Buna-N.

**PRIMING SYSTEM:** Pump shall be fitted with a fully automatic priming system incorporating a twin-cylinder compressor and air ejector assembly. No vacuum pumps will be accepted. The compressor shall be mounted on the pump bearing assembly and belt driven from the pump shaft. The compressor shall be self lubricated and cooled. The priming system shall require no fail-safe protection float gear or any adjusting at high or low suction lifts. Pumps with self-priming chambers modified with vacuum priming systems shall not be accepted as equal. The pump must be capable of running totally dry for extended periods of time, then re-priming and returning to normal pumping volumes. Pump and priming system is capable of priming the pump from a completely dry pump casing. The pump shall be capable of static suction lifts to 28 vertical feet, at sea level. It shall also be capable of operation using extended suction lines. Equipment acceptance shall be contingent upon the pump's ability to run continuously at full speed in a completely dry condition for an extended period of time. The engineer may require a demonstration.

**CHECK VALVE:** Pump shall be supplied with an integral ball-type check valve mounted on the discharge of the pump, allowing unrestricted flow from the impeller. The check valve shall prevent in-line return of flow when the pump is shut off. Non-return valve elastomers shall be Nitrile rubber and shall be field replaceable.

**DRIVE UNIT:** The drive unit shall be a diesel water-cooled engine. The engine shall drive the pump by use of direct connected intermediate drive plate. Starter shall be 12 volt electric. Safety shut down switches for low oil pressure and high temperature shall be integral to the engine control panel. Drive unit shall be a Yanmar 3TNV88C Final Tier 4 or

equal, rated at 25HP (continuous) at 2200RPM. A certified continuous-duty engine curve shall be supplied to the owner/engineer. .

**ENGINE CONTROL PANEL:** Engine speed shall be adjustable to operate the pump between maximum and minimum design operation speeds in manual mode. See section 2.3 for Automatic mode.

**FUEL SOURCE:** Integral skid fuel tank capacity shall be sufficient to provide at least twenty-four hours of operating time at full load. The engine shall be capable of operating satisfactorily on a commercial grade of distilled No. 2 fuel oil.

**EXHAUST:** Exhaust system shall include a critical grade muffler housed in a separate chamber within the enclosure. All exhaust piping and manifolds shall be encased in fitted acoustic blankets. They shall be constructed of high-density fiberglass material with waterproof jacketing.

**SOUND ATTENUATED ENCLOSURE:** The engine and pump shall be completely enclosed with fourteen-gauge sheet metal panels backed with one inch and two-inch layers of polydamp acoustical sound-deadening material. The acoustical enclosure shall reduce pump and engine noise to sixty-eight dBA or less at a distance of thirty feet. The enclosure shall be removable for easy access to the engine / pump for maintenance and repair. The enclosure doors shall all be equipped with latches that are keyed alike. For maintenance and service needs, the enclosure sides shall have hinged doors for quick access to the engine oil fill, fuel fill port, oil dipstick, and filters

**SKID BASE:** The pump and engine shall be skid mounted with an 80 gallon integral fuel tank. The fuel tank shall be equipped with drain plugs.

**TRAILER:** The pump and engine shall be mounted on a two wheeled, pneumatic type, single-axle trailer, incorporating a structural steel integral fuel tank of sixty gallons, giving up to twenty-four hours of nominal running time. The chassis will be constructed of heavy-duty rolled mild steel channel of 4 x 2 x 3/16 section. The fuel tank shall be equipped with drain plugs and large inspection/cleaning access plate. Trailer shall be equipped with fenders, electric brakes, front and rear support stands, safety chains, and side and rear reflectors. Trailer design shall be in compliance with applicable DOT regulations.

**FACTORY PAINTING:** Pump, engine, and base shall be shop primed and finish painted at the place of manufacturer. Materials and dry film thickness for priming and finish paint shall be in accordance with customer specifications.

#### **AUTOMATIC STARTING CONTROL SYSTEM**

The engine shall be equipped with a factory installed Prime Guard microprocessor-based controller as supplied by Godwin Pumps of America, Inc. and designed to start/stop the engine at a signal supplied by high and low level floats or a 4-20 mA transducer.

#### **ENGINE / PUMP CONTROL SPECIFICATIONS**

The engine shall be started, stopped, and controlled by a Prime Guard high performance state of the art digital controller as supplied by Godwin Pumps of America. The controller shall be weather proof enclosed, and contain an external weatherproof 12-position keypad accessible without the need to remove or open any protective cover or enclosure. It shall be designed to start/stop the engine at a signal supplied by high and low level floats or a 4-20 mA transducer. The Prime Guard Pump Control shall provide the following functions without modification, factory recalibration or change of chips or boards by simply accessing the keypad.

The keypad shall be a capacitive touch sensing system. No mechanical switches will be acceptable. The keypad shall operate in extreme temperatures, through ice, snow, mud, grease, etc. and maintain complete weather tight sealing of the Prime Guard Panel.

In automatic mode, the unit shall conserve energy and go to "sleep".

The Prime Guard panel shall function interchangeably from; float switches, pressure switch, or transducer as well as manual start/stop by selection at the keypad. No other equipment or hardware changes are required.

The Prime Guard Panel shall be capable of varying the engine speed to maintain a constant level in a process without a change to the panel other than via the keypad.

The start function can be programmed to provide 3 separate functions each day for 7 days (i.e. a start, warm up, exercise cycle on two separate days at different times and for a varying length of time all via the keypad).

Manual-Automatic Button

In Manual Mode, Manual "Start" button starts engine and runs until "Stop" button is depressed or an emergency shutdown occurs.

In Automatic Mode start/stop sequencing is initiated by either one-normally open and one-normally closed narrow angle float switches, pressure switch, transducer or a signal from a digital input.

The controller shall integrate the engine safety shut-off for low-oil temperature, high-temperature, and provide over-speed protection.

The controller shall include standard field adjustable parameters for engine cycle crank timer, shutdown time delay, warm-up time delay, and cool-down time delay.

The Prime Guard Panel shall have only one circuit board with 8 built in relays. Each relay can be named to provide any function all via the key pad without changing relays, chips, printed circuits or any hardware or software.

Standard components shall consist of (24) digital inputs, (7) analog inputs, (1) magnetic pick-up input, (8) 20-amp form "C" relays, (1) RS232 port, (1) RS485 port, (1) RS232/RS485 port, (1) J1939 port, and (1) 64X128 pixel full graphic LCD display with backlight.

The industrially hardened Prime Guard Panel shall withstand Vibration of 3 g, 3 axis, frequency swept 10-1000 Hz, in an operating temperature Range of 4° to 176°F (-20° to 80°C) and an operating humidity range of 0-95% Non-Condensing.

#### **OPTIONS**

**FULLY AUTOMATIC TRICKLE CHARGER:** The unit shall include a fully automatic trickle charger powered by 6-amperes, 115 VAC.

**ENGINE BLOCK/ COOLANT HEATER:** The drive unit shall be supplied with an integral 750-Watt thermostatically controlled engine block heater (8-amp, 115 VAC required).

**FLOATS:** The unit shall be supplied with one (1) float assembly including one (1) high-level N/O and one (1) low-level N/C narrow angle float switches which shall integrate with the engine control panel via a single multi-pin plug.

#### **MANUFACTURERS SERVICES**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one-half day.

#### **TOOLS AND SPARE PARTS**

The manufacturer shall furnish the following on delivery of the pumping system;

A recommended list of spare parts.

An Operations and Maintenance manual for the pump and engine.

#### **WARRANTY**

The manufacturer shall furnish the following to the owner:

A copy of the engine manufacturer's parts and labor warranty.

A one-year Parts and Labor Warranty issued by the manufacturer on the Trash Pump System. This warranty must cover all pump parts, including the mechanical seal.

**LINE ITEM NO. 45 PUMP, 6" Critically Silenced, Diesel Trailer Mounted Pump**

**Make: Godwin**

**Model: No. NC150 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirements for providing a six inch Critically Silenced, Diesel Trailer Mounted Pump.

GENERAL The specifications herein state the minimum requirements of the City of Houston. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The city may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the City of Houston to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification. Failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected, without review, as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section. Deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the specified quantity (x) year Godwin Dri-Prime® NC150 (6") trailer mounted pump or equal, as interpreted by the City of Houston. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the City of Houston. Based upon such inquiry, the City of Houston may choose to issue an Addendum in accordance with local public contract laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the City of Houston, must be prepared to review their specifications with the City of Houston and must, if requested, also be prepared to provide a unit for the convenience of the City of Houston. These services, if needed, are considered as part of the bidder's proposal and will be provided without cost or obligation to the City of Houston.

**SYSTEM DESCRIPTION**

Pump specified in this section will be a portable, trailer mounted diesel pumpset

Pump shall be fitted with a fully automatic priming system capable of repeated priming from a completely dry pump casing.

The pump and accessories shall be supplied by the pump manufacturer.

The pump offered shall be the manufacturer's standard production model. It shall have been in continuous use by municipal and industrial owners for a minimum of five years. A list of five user contacts including contact names and telephone numbers shall be provided with the bid submittal. Failure to supply a verifiable users list will be cause for rejection of the bid.

**DESIGN REQUIREMENTS**

CRITICALLY SILENCED PUMP

SOUND ATTENUATED ENCLOSURE

6" 150# FLANGE SUCTION AND DISCHARGE

JCB TCAE-55 FT4 DIESEL ENGINE

INCLUDES PRIMEGUARD ENGINE CONTROLLER

PUMPS SHALL BE SKID MOUNTED WITH SKIDS THEN MOUNTED ON A TRAILER

OPERATING SPEED (MAXIMUM)	2200 RPM
IMPELLER DIAMETER	10.8 INCHES
SUCTION SIZE	6 INCHES

DISCHARGE SIZE	6 INCHES
MAXIMUM SUCTION LIFT	28 FEET
MAXIMUM DUTY POINT	1200 GPM AT 125'TDTH (INCLUDING A 15' SUCTION LIFT)
SECOND DUTY POINT	1100 GPM AT 75'TDTH (INCLUDING A 20' SUCTION LIFT)
MAXIMUM SHUTOFF HEAD	165 FEET

**REFERENCES**

ANSI B16.1 - Standard for Cast Iron Pipe Flanges and Flanged Fittings.

**ACCEPTABLE MANUFACTURERS**

The pump shall be a Model NC150, size 6" x 6" as manufactured by GODWIN PUMPS, Bridgeport, New Jersey.

**EQUIPMENT**

**CASING, SUCTION COVER:** Pump castings shall be cast iron. Pump design shall incorporate a direct suction flow path that is in axial alignment with the impeller eye. There shall be no turns, chambers, or valves between the suction flange and the impeller eye.

**IMPELLER:** The impeller shall be of (ASTM A-48, Class 35B grey cast iron or ASTM A-532 (Alloy III A) 25% chrome cast iron), dynamically balanced, semi-open, multi-vane, back swept, screw-shaped, non-clog design. The impeller leading edges shall be mechanically self-cleaned automatically upon each rotation as they pass across a spiral groove located on the volute suction. The screw-shaped leading edges of the impeller shall be hardened to Rc 45 and shall be capable of handling solids, fibrous materials, heavy sludge and other matter normally found in wastewater. The screw shape of the impeller inlet shall provide an inducing effect for the handling of up to 5% sludge and rag-laden wastewater. The impeller to volute clearance shall be readily adjustable by the means of a single trim screw. The impellers shall be locked to the shaft, held by an impeller bolt and shall be coated with alkyd resin primer

**WEARPLATES:** Shall be fully adjustable and replaceable, fabricated of cast iron. Wear plate clearances shall have no relationship to the ability of the pump to achieve a prime.

**BEARINGS AND SHAFTS:** Pump shall be fitted with a bearing bracket to contain the shaft and bearings. Bearings shall be tapered roller bearings of adequate size to withstand imposed loads for sustained pumping at maximum duty points. Minimum ISO L10 bearing life to be 100,000 hours. Impeller shafts shall be fabricated of 1.5% chromium alloy.

**SEALS:** Seals shall be high pressure, mechanical self-adjusting type with silicon carbide faces capable of withstanding suction pressures to 40 psi. The mechanical seal shall be cooled and lubricated in an oil bath reservoir, requiring no maintenance or adjustment. Pump shall be capable of running dry, with no damage, for periods up to twenty-four hours. All metal parts shall be of stainless steel. Elastomers shall be Viton.

**PUMP SUCTION AND DISCHARGE FLANGES:** Shall be cast iron ANSI (B16.1) Class 150, flat faced.

**PUMP GASKETS:** Shall be compressed fiber and/or Teflon.

**PUMP O RINGS:** Shall be Buna-N.

**PRIMING SYSTEM:** Pump shall be fitted with a fully automatic priming system incorporating a twin-cylinder compressor and air ejector assembly. No vacuum pumps will be accepted. The self-lubricated, self-cooled compressor shall be mounted on the pump bearing bracket and belt driven by the pump shaft. The priming system shall require no fail-safe protection float gear or any adjusting at high or low suction lifts. Pumps with self-priming chambers modified with vacuum priming systems shall not be accepted as equal. The pump must be capable of running totally dry for periods up to 24 hours, then re-priming and returning to normal pumping volumes. Pump and priming system is capable of priming the pump from a completely dry pump casing. The pump shall be capable of static suction lifts to 28 vertical feet, at sea level. It shall also be capable of operation using extended suction lines. Equipment acceptance shall be contingent upon the pump's ability to run continuously at full speed in a completely dry condition for periods up to 24 hours. The engineer may require a demonstration.

**CHECK VALVE:** Pump shall be supplied with an integral ball-type check valve mounted on the discharge of the pump, allowing unrestricted flow from the impeller. The check valve shall prevent in-line return of flow when the pump is shut off. Non-return valve elastomers shall be Nitrile rubber and shall be field replaceable.

**DRIVE UNIT:** The drive unit shall be a diesel water-cooled engine. The engine shall drive the pump by use of direct-connected intermediate drive plate. Starter shall be 12VDC electric. Safety shut down switches for low oil pressure and high temperature shall be integrated into the engine control panel. Unit shall include a tachometer and an hour meter.

Drive unit shall be a JCB model TCAE-55 final Tier 4 or equal, rated at 74HP (continuous) at 2200 R.P.M. A certified continuous-duty engine curve shall be supplied to the owner/engineer.

GOVERNOR: Governor shall be electronic type. Engine speed shall be adjustable to operate the pump between maximum and minimum design operation speeds.

FUEL SOURCE: Integral skid fuel tank capacity shall be sufficient to provide at least twenty hours of operating time at full load. The engines shall be capable of operating satisfactorily on commercial grade of distilled No. 2 fuel oil.

EXHAUST: Exhaust system shall include critical grade silencer.

SOUND ATTENUATED ENCLOSURE: The engine and pump shall be completely enclosed with fourteen-gauge sheet metal panels backed with one inch and two-inch layers of polydamp acoustical sound-deadening material. The acoustical enclosure shall reduce pump and engine noise to sixty-eight dBA or less at a distance of thirty feet. The enclosure shall be removable for easy access to the engine / pump for maintenance and repair. The enclosure doors shall all be equipped with latches that are keyed alike. For maintenance and service needs, the enclosure sides shall have hinged doors for quick access to the engine oil fill, fuel fill port, oil dipstick, and filters

TRAILER: The pump and engine shall be mounted on a two wheeled, pneumatic type, single-axle trailer, incorporating a structural steel integral fuel tank of sixty gallons, giving up to twenty-four hours of nominal running time. The chassis will be constructed of heavy-duty rolled mild steel channel of 4 x 2 x 3/16 section. The fuel tank shall be equipped with drain plugs and large inspection/cleaning access plate. Trailer shall be equipped with fenders, electric brakes, front and rear support stands, safety chains, and side and rear reflectors. Trailer design shall be in compliance with applicable D.O.T. regulations.

FACTORY PAINTING: Pump, engine, and base shall be shop primed and finish painted at the place of manufacturer. Materials and dry film thickness for priming and finish paint shall be in accordance with customer specifications.

#### **AUTOMATIC STARTING CONTROL SYSTEM**

The engine shall be equipped with a factory installed PrimeGuard microprocessor-based controller as supplied by Godwin Pumps of America, Inc. and designed to start/stop the engine at a signal supplied by high and low level floats or a 4-20 mA transducer.

#### **ENGINE / PUMP CONTROL SPECIFICATIONS**

The engine shall be started, stopped, and controlled by a PrimeGuard high performance state of the art digital controller as supplied by Godwin Pumps of America, Inc. The controller shall be weather proof enclosed, and contain an external weatherproof 12-position keypad accessible without the need to remove or open any protective cover or enclosure. It shall be designed to start/stop the engine at a signal supplied by high and low level floats or a 4-20 mA transducer. The PrimeGuard controller shall provide the following functions without modification, factory recalibration, or change of chips or boards, by simply accessing the keypad.

The keypad shall be a capacitive touch sensing system. No mechanical switches will be acceptable. The keypad shall operate in extreme temperatures, with gloves, through ice, snow, mud, grease, etc. and maintain complete weather-tight sealing of the PrimeGuard controller.

In automatic mode, the unit shall conserve energy and go to "sleep".

The PrimeGuard controller shall function interchangeably from float switches, pressure switch, or transducer, as well as manual start/stop by selection at the keypad. No other equipment or hardware changes are required.

The start function can be programmed to provide three (3) separate functions each day for seven days (i.e. a start, exercise cycle) OR on three separate days at different times and for a varying length of time all via the keypad.

Manual-Automatic Button:

In Manual Mode, manual "Start" button shall start engine and engine shall continue to run until "Stop" button is depressed or an emergency shutdown occurs.

In Automatic Mode, start/stop sequencing shall be initiated by either one (1) high-level N/O and one (1) low-level N/C narrow angler float switches, pressure switch, transducer, or a signal from a digital input.

The controller shall integrate the engine safety shut-off for low and high oil temperature, and provide over-speed protection.

The controller shall include standard, field-adjustable parameters for engine cycle crank timer, and shutdown time delay.

The PrimeGuard controller shall have only one circuit board with eight built-in relays. Three (3) of the relays shall be programmable to output desired parameter on display and to be used as dry-contacts for communication with City/Municipality SCADA system, all via the keypad without changing relays, chips, printed circuits, or any hardware or software.

Standard components shall consist of (24) digital inputs, (7) analog inputs, (1) magnetic pick-up input, (8) 20-amp form "C" relays, (1) RS232 port, (1) RS485 port, (1) RS232/RS485 port, (1) J1939 port, and (1) 64X128 pixel full graphic LCD display with backlight.

The industrially-hardened PrimeGuard Controller shall withstand Vibration of 3 g, 3 axis, frequency swept 10-1000 Hz, in an operating temperature Range of 4° to 176°F (-20° to 80°C) and an operating humidity range of 0-95% Non-Condensing.

### **OPTIONS**

**FULLY AUTOMATIC TRICKLE CHARGER:** The unit shall include a fully automatic trickle charger powered by 6-amperes, 115 VAC.

**FLOATS:** The unit shall be supplied with one (1) float assembly including one (1) high-level N/O and one (1) low-level N/C narrow angle float switches which shall integrate with the engine control panel via a single multi-pin plug.

**DOT LIGHT:** The trailer shall include a DOT approved lighting package.

### **MANUFACTURERS SERVICES**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one-half day.

### **TOOLS AND SPARE PARTS**

The manufacturer shall furnish the following on delivery of the pumping system.

A recommended list of spare parts.

An Operations and Maintenance manual for the pump and engine.

### **WARRANTY**

The manufacturer shall furnish the following to the owner:

A copy of the engine manufacturer's parts and labor warranty.

A one-year Parts and Labor Warranty issued by the manufacturer on the trailer mounted pump. This warranty must cover all pump parts, including the mechanical seal.

**LINE ITEM NO. 46 PUMP, 8" CRITICALLY SILENCED TRAILER MOUNTED PUMP WITH PRIME GUARD CONTROLLER**

**Make: Godwin**

**Model: No. CD225M or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirements for providing an Critically Silenced Trailer Mounted Pump

GENERAL. The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The *City of Houston* may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the specified *quantity (x) year* Godwin Dri-Prime® CD225M eight-inch (8") trailer-mounted pump and sound attenuated enclosure or equal, as interpreted by the by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, at the request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested, also be prepared to provide a unit for the convenience of the *City of Houston*. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**SYSTEM DESCRIPTION**

The pump specified in this section will be used to pump raw water.

The pump and accessories shall be supplied by the pump manufacturer.

The pump shall be fitted with a fully automatic priming system incorporating an air compressor, air ejector assembly, and an air/water separation tank. The priming system shall be capable of priming the pump from a completely dry pump casing. The air ejector shall operate on the discharge side of the compressor, eliminating the possibility of water being drawn into the air source. The pump must be capable of running totally dry for periods up to 24 hours, then automatically re-priming and returning to normal pumping volumes without need for any adjustment.

The priming system shall not use a vacuum or diaphragm pump, nor require the use of a "Foot" type valve. It shall contain no moving parts or protective float gear. Priming systems that require manual water additions to facilitate pump priming are not acceptable. A demonstration of the pump's ability to repeatedly cycle from dry suction/pump/snore /repriming/pump shall be required. This will necessitate the draining of all residual water from the pump case to initiate a dry suction starting condition.

The diesel engine driven pump unit shall be mounted in a drop-in style trailer with tires that can be towed on the road at 50 M.P.H. and shall be wired for over the road usage, per applicable D.O.T. Standards.

The engine and pump shall be completely enclosed with 14 gauge sheet metal panels backed with 1" and 2" layers of polydamp acoustical sound deadening material. The acoustical enclosure shall reduce pump and engine noise to sixty-

eight dBA or less at a distance of 30 feet. The panels shall be removable for easy access to the engine/pump for maintenance and repair. The engine control panel shall have a locking door for visual inspection. For maintenance and service needs, the pump discharge side of the trailer shall have a hinged door for quick access to the engine oil fill, fuel fill port, oil dipstick and filters.

Pump and priming system shall be fully automatic, needing no form of adjustment or manual addition of water for the priming system. The pump shall be capable of static suction lifts to 28 vertical feet, at sea level. It shall also be capable of operation using extended suction lines.

Equipment acceptance shall be contingent upon the pump's ability to run continuously at full speed in a completely dry condition for periods up to 24 hours. This may require the draining of all residual water in the pump casing to simulate a dry suction/case condition. The engineer may require a demonstration.

The pump offered shall be the manufacturer's standard production model. It shall have been in continuous use by municipal and industrial owners for a minimum of five years. A list of five user contacts including contact names and telephone numbers shall be provided with the bid submittal. Failure to supply a verifiable users list will be cause for rejection of the bid.

**DESIGN REQUIREMENT**

OPERATING SPEED (MAXIMUM)	2200 RPM
MAXIMUM SOLIDS HANDLING SIZE	3.125 INCHES
IMPELLER DIAMETER	290 MM
SUCTION SIZE	8 INCHES
DISCHARGE SIZE	8 INCHES
MAXIMUM SUCTION LIFT	28 FEET
MAXIMUM DUTY POINT	2100 GPM AT 120'TD <sub>H</sub> (INCLUDING A 15' SUCTION LIFT)
SECOND DUTY POINT	1800 GPM AT 70'TD <sub>H</sub> (INCLUDING A 25' SUCTION LIFT)

**REFERENCES**

ANSI B16.1 - Standard for Cast Iron Pipe Flanges and Flanged Fittings.

**ACCEPTABLE MANUFACTURES**

The pump shall be a Model CD225M, size 8" x 8" as manufactured by GODWIN PUMPS, Bridgeport, New Jersey. Or equivalent.

**EQUIPMENT**

CASING, SUCTION COVER, SEPARATION TANK: Pump castings shall be cast iron. Pump design shall incorporate a direct suction flow path that is in axial alignment with the impeller eye. There shall be no turns, chambers or valves between the suction flange and the impeller eye.

IMPELLERS: The pump impeller shall be an open, three-bladed, non-clog type with pump-out vanes on the back shroud and fabricated from hardened cast chromium steel construction (minimum Brinell Hardness 340 HB).

WEARPLATES: Shall be fully adjustable and replaceable, fabricated of cast iron. Wearplate clearances shall have no relationship to the ability of the pump to achieve a prime.

BEARINGS AND SHAFTS: Pump shall be fitted with a bearing bracket to contain the shaft and bearings. Bearings shall be tapered roller bearings of adequate size to withstand imposed loads for sustained pumping at maximum duty points. Minimum ISO L<sub>10</sub> bearing life to be 100,000 hours. Impeller shafts shall be fabricated of 1.5% chromium alloy.

SEALS: Seals shall be high pressure, mechanical self-adjusting type with silicon carbide faces capable of withstanding suction pressures to 100 psi. The mechanical seal shall be cooled and lubricated in an oil bath reservoir, requiring no maintenance or adjustment. Pump shall be capable of running dry, with no damage, for periods up to 24 hours. All metal parts shall be of stainless steel. Elastomers shall be Viton.

PUMP SUCTION AND DISCHARGE FLANGES: Shall be cast iron ANSI (B16.1) Class 150, raised faced.

PUMP GASKETS: Shall be compressed fiber and/or Teflon.

PUMP O-RINGS: Shall be Viton.

**PRIMING SYSTEM:** Pump shall be fitted with a fully automatic priming system incorporating a twin-cylinder compressor and air ejector assembly, no vacuum pump. The compressor shall be installed on the engine auxiliary drive and shall be gear driven, lubricated and cooled from the engine. The priming system shall require no fail-safe protection float gear or any adjusting at high or low suction lifts. Pumps with self-priming chambers modified with vacuum priming systems shall not be accepted as equal.

**CHECK VALVE:** Pump shall be supplied with an integral swing type check valve mounted on the discharge of the pump allowing unrestricted flow from the impeller. The check valve shall prevent in-line return of flow when the pump is shut off. Non-return valve elastomers shall be Nitrile rubber and shall be field replaceable.

**DRIVE UNIT:** The drive unit shall be a diesel water-cooled engine. The engine shall drive the pump by use of direct connected intermediate drive plate. Starter shall be 12 volt electric. Safety shut down switches for low oil pressure and high temperature shall be integral to the engine control panel. Battery shall have 180-amp hour rating. The engine control panel shall include a tachometer and an hour meter. Drive unit shall be a John Deere 4045HC92 IT4 or equal, rated at 99 HP (continuous) at 2200 RPM. A certified continuous duty engine curve shall be supplied to the owner/engineer.

**ENGINE CONTROL PANEL:** Engine speed shall be adjustable to operate the pump between maximum and minimum design operation speeds in manual mode.

**FUEL SOURCE:** Fuel tank capacity shall be sufficient to provide at least 20 hours of operating time at full load. The engine shall be capable of operating satisfactorily on a commercial grade of distilled No. 2 fuel oil.

**EXHAUST:** Exhaust system shall include a critical grade muffler of suitable size. Exhaust system shall have muffler and exhaust tubing sized to match maximum engine exhaust flow without exceeding engine manufacture's maximum allowable back pressure values.

**TRAILER:** The complete pump assembly shall be mounted in a twin axle trailer with a pintle type trailer hitch. The sound attenuated unit shall be attached to the trailer frame using Grade 8 nuts and bolts. Tires and leaf spring suspension shall be adequately sized for the required load range ratings. Trailers shall be equipped with fenders, electric brakes, front and rear support stands, lifting bar, safety chains and side and rear reflectors. Trailer design shall be in compliance with applicable DOT regulations.

**FACTORY PAINTING:** Pump, engine, base, and trailer shall be shop primed and finish painted at the place of manufacturer. Materials and thickness for priming shall be in accordance with manufacturer's standards.

#### **AUTOMATIC STARTING CONTROL SYSTEM**

The engine shall be equipped with a factory installed Prime Guard microprocessor-based controller as supplied by Godwin Pumps of America, Inc. and designed to start/stop the engine at a signal supplied by high and low level floats or a 4-20 mA transducer.

#### **ENGINE/PUMP CONTROL SPECIFICATIONS**

The engine shall be started, stopped, and controlled by a PrimeGuard high performance, state-of-the-art digital Controller as supplied by Godwin Pumps of America. The Controller shall be weatherproof enclosed, and contain an external, weatherproof, 12-position keypad accessible without the need to remove or open any protective cover or enclosure. It shall be designed to start/stop the engine at a signal supplied by high- and low-level floats or a 4-20 mA transducer. The PrimeGuard Control Panel shall provide the following functions without modification, factory recalibration, or change of chips or boards by simply accessing the keypad.

The keypad shall be a capacitive touch sensing system. No mechanical switches will be acceptable. The keypad shall operate in extreme temperatures, through ice, snow, mud, grease, etc., and maintain complete weather-tight sealing.

In automatic mode, the unit shall conserve energy and go to "sleep."

The PrimeGuard Controller shall function interchangeably from; float switches, pressure switch, or transducer, as well as manual start/stop by selection at the keypad. No other equipment or hardware changes are required.

The PrimeGuard Controller shall be capable of varying the engine speed to maintain a constant level in a process without a change to the panel other than via the keypad.

The start function can be programmed to provide three separate functions each day for seven days (i.e., a start, warm-up, exercise cycle on two separate days at different times and for a varying length of time, all via the keypad).

## **MANUAL AUTOMATIC BUTTON**

In Manual Mode, the "Start" button starts the engine and runs until "Stop" is pressed or an emergency shutdown occurs.

In Automatic Mode, start/stop sequencing is initiated by one normally-open and one normally-closed narrow angler float switch, a pressure switch, transducer, or a signal from a digital input.

The Controller shall integrate the engine safety shut-off for low-oil temperature, high-temperature, and provide over-speed protection.

The Controller shall include standard field-adjustable parameters for engine cycle crank timer, shutdown time delay, warm-up time delay, and cool-down time delay.

The Controller shall have only one circuit board with eight built in relays. Each relay can be named to provide any function - all via the key play - without changing relays, chips, printed circuits, or any hardware or software.

Standard components shall consist of (24) digital inputs, (7) analog inputs, (1) magnetic pick-up input, (8) 20 amp form "C" relays, (1) RS232 port, (1) RS485 port, (1) RS232/RS485 port, (1) J1939 port, and (1) 64x128 pixel full graphic LCD display with backlight.

The industrially-hardened PrimeGuard Controller shall withstand vibration of 3 g, 3 axis, frequency swept 10-1000 Hz, in an operating temperature range of 4° to 176°F (-20° to 80°C) and an operating humidity range of 0-95% non-condensing.

## **OPTIONS**

FLOAT SWITCHES: The Controller shall be supplied with one-normally open and one-normally closed narrow angler (10° to 20°) float switches. The floats shall be constructed with tilt sensation mercury switches enclosed within stainless steel. Each float will have a minimum 25 ft. waterproof cable wired into a twist-lock wiring harness that connects directly to the PrimeGuard Controller.

## **MANUFACTURERS SERVICES**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

## **TOOLS AND SPARE PARTS**

The manufacturer shall furnish the following on delivery of the pumping system.

A recommended list of spare parts.

An Operations and Maintenance manual.

## **WARRANTY**

The manufacturer shall furnish the following to the owner:

A copy of the engine manufacturer's parts and labor warranty.

A One year Parts and Labor Warranty issued by the manufacturer on the pumpset. This warranty must cover all pump parts, including the mechanical seal.

**LINE ITEM NO. 47 - Pump, Submersible, Electric.**

**Make: KSB**

**Model: K600-710/A23012UNG-K or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Electric,** for the **Southwest WWTP.**

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to lift raw sewage from the lift station wet well to the treatment process.

**Pump:**

Operating Conditions- Design: 21,500 @ Min 31.14ft – Max 45.88ft TDH

Maximum Motor HP: 330 HP

Pump Hydraulic Efficiency at BEP 70% or greater

Maximum Motor RPM: 590

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 48 - Pump, Submersible, Sewage Pump**

**Make: KSB**

**Model: KRT K200-501/1206UNG-K or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Sewage Pump**, for the **Upper Braes WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to lift raw sewage from the lift station wet well to the treatment process.

Operating Conditions- Design: 3,000 @ 135 ft. TDH

Maximum Motor HP: 161 HP

Pump Hydraulic Efficiency at BEP 70% or greater

Maximum Motor RPM: 1160

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

## **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

## **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 49 - Pump, Submersible**

**Make: KSB**

**Model: KRT K 100-316/234XG or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Sewage Pump**, for the **Northeast WPP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to provide adequate pumping capabilities to the plant.

28HP  
50' POWER CABLE  
30' LIFTING CHAIN & LIFTING BAIL  
REUSE CLAW  
460V, 3-PHASE

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

## **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

## **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's DRINKING WATER OPERATIONS/NORTHEAST, 12121 N. SAM HOUSTON PARKWAY E., Humble, TX 77396 with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 50 - Pump, Submersible, Dry Pit**

**Make: KSB**

**Model: Sewablock K 125-315/GVF (B03) or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Dry Pit**, for the **Longwoods Lift Station**.

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to AC, Model 200 NSWV 8X8X17 SC, pump as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

Requirements for providing dry pit pump complete with rotating assembly.

20 HP, 1160 RPM, 460 V, NEMA FRAME 286TC, Premium Efficient Motor

**CASING:** Pump castings shall be cast iron conforming to ASTM A48 Class 30 ductile iron or better. Thickness and weight shall insure long life, accurate alignment and reliable operation. Casing shall be designed to allow removal of rotating elements without disturbing piping connections.

**IMPELLERS:** The pump impeller shall be non-clog designed with smooth passage to pass liquid and prevent clogging of stringy fibrous material. The impeller material type made of cast iron conforming to ASTM A48 Class 30 cast iron. Impeller shall be statistically and dynamically balanced. Impeller fastener shall be stainless steel.

**WEAR RINGS:** Shall be furnished with the impeller and case wear ring and must be fully adjustable and replaceable. Wear rings shall be constructed of stainless steel with a BHN of 300-350.

**BEARINGS:** The minimum  $L_{10}$  bearing life shall be 50,000 hours at the best efficiency point. Bearing shall be properly sized to accommodate all, mechanical and hydraulic thrusts.

**SHAFT SLEEVE:** Shaft shall be constructed of stainless steel with a BHN of 410-484. Shaft shall be designed of sufficient size to transmit the maximum horsepower and at maximum rated motor operating speed. . It shall be protected from the pump liquid by shaft sleeve in the stuffing box area.

### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Be present during installation of pump. Inspect the system prior to delivery, supervise the City of Houston during start up and testing and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of (1) year warranty from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

Components failing to perform as specified by the engineer or City of Houston representative shall be replaced, repaired, or satisfactorily modified by the supplier without cost of parts or labor to the owner.

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Mr. Richard Bellinger, WWTP Maintenance, Operations Branch, 7440 Cullen, Houston, Texas 77051 ( Phone # 713-591-8663 or 832-395-3535).

**LINE ITEM NO. 51 - Pump, NPW Booster Pump & Motor ssembly**

**Make: Aurora**

**Model: 344ABF or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, NPW Booster Pump & Motor Assembly**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to elevate non-potable water pressure in the plant waster distribution piping system facilitate service to the Dewatering/Drying Facility.

**Pump:**

2 x 2.5 x 9  
8.687" IMPELLOR  
7.5 HP, 1800RPM, 3/230/460  
213T FRAME ELECTRIC MOTOR TEFC  
COUPLING w/COUPLING GUARD, w/STEEL BASE  
RATED DUTY: 150 GPM @ 80' TDH @ 1750 RPM  
PUMP TYPE: CENTRIFUGAL  
PUMP SIZE: 2X 2 ½ X 9 INCHES  
IMPELLER DIAMETER: 9"  
SERVICE FACTOR: 1.0  
MOTOR DRIVE: 10-HP, 460-VAC, 3-PHASE, 60-HZ

The output shall be 150 GPM @ 80' TDH @ 1750 RPM

Impeller diameter shall be 9"

The inlet and outlet size shall be 2" discharge and 2 1/2" suction flange connection

Pump shall have a volute type casing made of cast iron

Pump shaft shall be made of steel

**Motor:**

Motor frame shall be rated at 1745 RPM  
Motor shall be 10 HP  
Motor shall be electric with a 1.0 service factor  
Motor shall be totally enclosed fan cooled induction motor  
Motor shall be horizontally mounted

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up, whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH Gurdip Hyare, Managing Engineer 832-395-5459

**LINE ITEM NO. 52 - Pump, NPW Booster Pump & Motor Assembly**

**Make: Aurora**

**Model: 344ABF or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, NPW Booster Pump & Motor Assembly**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to elevate the water pressure to ensure that there is adequate water flow for the dewatering process and fire fog safety equipment which is there to prevent system fires.

**Pump:**

4 x 5 x 12, 8.687" IMPELLOR DIA. 11,3125", 40 HP, 1800RPM, 3//60/230/460V, ELECTRIC MOTOR TEFC, w/STEEL BASE

RATED DUTY: 770 GPM @ 128' TDH @ 1750 RPM

PUMP TYPE: CENTRIFUGAL

PUMP SIZE: 4 X 5 X 12 INCHES

IMPELLER DIAMETER: 12"

SERVICE FACTOR: 1.0

MOTOR DRIVE: 50-HP, 460-VAC, 3-PHASE, 60-HZ

The output shall be 770 GPM @ 1280' TDH @ 1750 RPM

Impeller diameter shall be 12"

The inlet and outlet size shall be 4" discharge and 5" suction flange connection

Pump shall have a volute type casing made of cast iron

Pump shaft shall be made of steel

**Motor:**

Motor frame shall be rated at 1775 RPM  
Motor shall be 50 HP  
Motor shall be electric with a 1.0 service factor  
Motor shall be totally enclosed fan cooled induction motor  
Motor shall be horizontally mounted

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up, whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH Gurdip Hyare, Managing Engineer 832-395-5459.

**LINE ITEM NO. 53 - Pump, Pump & Motor Assembly**

**Make: Aurora**

**Model: 364ABF or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Pump & Motor Assembly**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to elevate the water pressure to insure that there is adequate water for specific areas.

2.5 x 3 x 12

12.4375' IMPELLOR DIA. PF#3, WEG 25 HP, 1800RPM, 3/60/230/460, 284T FRAME ELECTRIC MOTOR TEFC, w/COUPLING GUARD, MECHANICAL SEAL TYPE 21, SEMI OPEN IMPELLOR SPECIFIED ON

SERIAL#00-115089, w/STEEL BASE

RATED DUTY: 300 GPM @ 117' TDH @ 1760 RPM

PUMP TYPE: CENTRIFUGAL

PUMP SIZE: 2 ½ X 3 X 12 INCHES

IMPELLER DIAMETER: 12"

**Motor:**

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 54 - Pump, Vertical, Turbine, Sump Pump**

**Make: Floway**

**Model: 14DKH or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Vertical, Turbine, Sump Pump**, for the **West District WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to pump non-potable water from the chlorine contact basin to the sludge line.

3 STAGE VERTICAL TURBINE SUMP PUMP ASSEMBLY,  
OPERATING FLOW (Required) 2100 GPM @ 150.0 ft. TDH  
DISCHARGE SIZE 10 in  
MOTOR 100 HP, 460 V, 1800 RPM

PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION

Material: Material shall conform to applicable ASTM standards in order to ensure long life, accurate alignment and reliable operation. Material shall be able to withstand chlorinate water.

IMPELLERS: The impeller material type shall conform to at least ASTM B584-90B Alloy838. The impeller shall be properly balanced and double keyed.

SUCTION BELL: The suction bell material type shall conform to at least ASTM B505-91 Alloy 932

BEARINGS AND SHAFTS: The minimum L10 bearing life shall be 50,000 hours at the best efficiency point. Shaft material shall conform to at least ASTM A582-88a Type 416

STUFFING BOX: The stuffing box material type shall conform to at least ASTM B584-90B Alloy838.

### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Mr. Ray Belton, Wastewater Operations Branch, Phone 713-562-4093.

**LINE ITEM NO. 55 - Pump, Vertical, Turbine, Sump Pump**

**Make: Floway**

**Model: 6JKM-4 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Vertical, Turbine**, for the **Upper Braes**.

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to supply non-potable water to the treatment plant as well as the beltpresses.

The vertical turbine pump specified in this section will be used to pump non-potable water from the chlorine contact basin to the sludge line.

OPERATING FLOW (Required)	260.0 GPM @ 200.0 ft. TDH
DISCHARGE SIZE	6 in
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION	

**Material:** Material shall conform to applicable ASTM standards in order to ensure long life, accurate alignment and reliable operation. Material shall be able to withstand chlorinate water.

**IMPELLERS:** The impeller material type shall conform to at least ASTM B584-C90300 Alloy838. The impeller shall be properly balanced and double keyed.

**SUCTION BELL:** The suction bell material type shall conform to at least ASTM B505-91 Alloy 932

**BEARINGS AND SHAFTS:** The minimum L<sub>10</sub> bearing life shall be 50,000 hours at the best efficiency point. Shaft material shall conform to at least ASTM A582-88a Type 416

**STUFFING BOX:** The stuffing box material type shall conform to at least ASTM B584-90B Alloy838.

COUPLING: The coupling material type shall conform to at least ASTM A582-88a Type 416. Coupling shall be sufficiently sized to transfer nameplate horse power of the motor and shall be capable of absorbing shock, vibration and minor misalignment.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one (1) year warranty from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact with Stephen Hooks, Wastewater Operations Branch, Phone 281-960-7513.

**LINE ITEM NO. 56 - Pump, Chemical Feed**

**Make: ProMinent**

**Model: Sigma 2 Control Ver b or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Chemical Feed**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to feed chemicals to the odor control system.

FLOW RATE 264L/H; 69.7 GPH  
PRESSURE 7 BAR; 100 PSI  
VOLTAGE SUPPLY 115 – 230V, 1PH, 50/60 HZ  
ENCLOSURE TEFC

Pump flow rate shall be 264L/H, 69.7 GPH  
Pump seals shall be PTFE seals  
Pump hydraulic connection shall be PVDF clamping nut & insert  
Pump cable & plug shall be North American plug, 115 V, 2M

**Motor:**

Motor shall be 1/3 HP TEFC  
Motor shall have PPE plastic housing with a NEMA 3 enclosure rating

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

Tools and spare parts for at least 1 year.

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Aisha Niang (Phone # 832-395-5465).

**LINE ITEM NO. 57 - Pump, Hose, Chemical Feed**

**Make: Watson Marlow**

**Model: Bredel 32-35 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Hose, Chemical Feed**, for the **Northeast WPP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

32-35 HOSE PUMP FOR PAC SLURRY SERVICE  
1.5", 150# FLANGE  
NATURAL RUBBER HOSE  
1.5HP, 1800 RPM, 230/460VAC, 3-PHASE, 60hz

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

## **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's DRINKING WATER OPERATIONS/NORTHEAST, 12121 N. SAM HOUSTON PARKWAY E, Humble, TX 77396, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 58 - Pump, Sludge Pump, Double Disc**

**Make: Sludge Pro**

**Model: SDWP-AP or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Sludge Pump, Double Disc**, for the **69<sup>th</sup> Street WWTP**.

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to remove the heavy solids from the respective first step clarifier heavy solids pit.

PUMP PERFORMANCE 63 GPM @ 23' TDH

MOTOR DRIVE 7.5 HP, (160 cfm, 100 PSI)

CONNECTION 6"

DISPLACEMENT 1.15 GAL/REV

OPERATING SPEED 0-110 RPM

SP. GR. 1.0 @ 68o F

**Pump:**

The output shall be 63 GPM @ 23' TDH

Pump connection size shall be 6" 150# Flanged

Pump displacement shall be 1.5 gals/revolution

Max. liquid temp shall be 350o F (176o C)

**Motor:**

Motor operating speed shall be 0-110 RPM

Motor shall be 7.5 HP Gast air motor connected to SEW Eurodrive R77gear box

Motor drive shaft shall be 2" – A4140/4142 Alloy high tensile

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

Tools and spare parts for at least one year.

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from startup whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Aisha Niang (Phone # 832-395-5465).

**LINE ITEM NO. 59 - Pump, Diaphragm**

**Make: Versa-Matic**

**Model: E3 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Diaphragm**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to transfer chemicals from storage tanks and totes when required.

Flow Rate: (Adjustable) 0-238 gpm (901- 1 pm)  
Port Size: Inlet and Outlet: 3.0" ANSI or DIN 80 Flange  
Air Inlet: 0.75" NPTF  
Air Exhaust: 1.00" NPTF  
Suction Lift: 20' Dry/25' Wet (6.10m/7.62m), Teflon: 10' Dry/20'  
Wet(3.05m/6.10m)  
Max. Particle Size (Dia.): 0.71" (18mm)  
Shipping Weights: Polypropylene: 231 lbs, (105kg), PVDF: 315 lbs (143 kg)

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

## **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

## **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's DRINKING WATER OPS, 2300 FEDERAL RD., Houston, TX 77015, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 60 - Pump, Submersible, Sewage, Explosion Proof**

**Make: Ebara**

**Model: 100DLFMU63.74 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible, Sewage, Explosion Proof**, for the **Turkey Creek WWTP**.

**GENERAL:** The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

**EQUIVALENT PRODUCT:** Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

**INTERPRETATIONS:** In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

**GENERAL SPECIFICATIONS:** The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The submersible pump, to pump reactivated sludge from aeration basin at Turkey Creek WWTP (FN 201). Specification is for pump only. Pump should include pump safe modules.

OPERATING FLOW (Required)	300 GPM @ 12 ft. TDH
DISCHARGE SIZE	4 in
SOLID DIAMETER	3 IN
TYPE OF SEAL	Mechanical seal
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION	

**CASING:** Pump castings shall be cast iron conforming to ASTM A48 Class 35B ductile iron or better. Thickness and weight shall insure long life, accurate alignment and reliable operation. Casing shall be designed to allow removal of rotating elements without disturbing piping connections.

**IMPELLERS:** The pump impeller shall be non-clog designed with smooth passage to pass liquid and prevent clogging of stringy fibrous material. The impeller material type made of cast iron conforming to ASTM A48 Class 35B cast iron. Impeller shall be statistically and dynamically balanced. Impeller fastener shall be stainless steel.

**WEAR RINGS:** Shall be furnished with the impeller and case wear ring and must be fully adjustable and replaceable. Wear rings shall be constructed of stainless steel with a BHN of 300-350.

BEARINGS: The minimum  $L_{10}$  bearing life shall be 50,000 hours at the best efficiency point. Bearing shall be properly sized to accommodate all, mechanical and hydraulic thrusts.

SHAFT SLEEVE: Shaft shall be constructed of stainless steel with a BHN of 410-484. Shaft shall be designed of sufficient size to transmit the maximum horsepower and at maximum rated motor operating speed. . It shall be protected from the pump liquid by shaft sleeve in the stuffing box area.

### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

Components failing to perform as specified by the engineer or City of Houston representative shall be replaced, repaired, or satisfactorily modified by the supplier without cost of parts or labor to the owner.

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Mr. Stephen Hooks, WWTP Maintenance, Operations Branch, 7440 Cullen, Houston, Texas 77051 ( Phone # 281-960-7513).

**LINE ITEM NO. 61 - Pump and Mixing Chamber**

**Make: Shanley Pump and PolyBlend Mixing Chamber**

**Model: ADP 1.50.3 / M-6000 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump and Mixing Chamber**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump and mixing chamber specified here will be used to work in conjunction with each for the coagulation of sludge that needs to be processed.

Installation will be performed by COH Maintenance.

**Pump:**

- 1) Pump: Must be able to pump and meter liquids of low or high viscosity, neutral or corrosive liquids, un contaminated or abrasive liquids, liquids containing gases or which tend to froth, including liquids containing fibrous and solid material.
- 2) Application: Must be able to be used in wastewater application for pumping polymer.
- 3) Operation: Must be able to stay in service for long period of time and produce no turbulence and withstand the constant volume of product coming from the Polymer tanks.
- 4) Design features- Suction casing, bearings, shaft seal and coupling rods, rotor and stator.
- 5) Viscosities to 20,000 CP

**Mixing Chamber:**

- 1) Base & Frame- Must be compatible to fit in existing base and bolt up to existing flanges.
- 2) Must have rear cap, Mechanical seal, Impeller, Baffle plate rear & front, O-rings.
- 3) Tube should be made of Acrylic or of equivalent material.

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after receiving the equipment.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 62 - Pump, Submersible Chopper**

**Make: Vaughan**

**Model: S4L-075 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Submersible Chopper**, for the **69<sup>TH</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to pump scum and floatables skimmed from the surface of the clarifier to the scum separator for disposal.

VAUGHN MODEL#S4L-075 CHOPPER SUBMERSIBLE PUMP, SN#120387 or City Approved Direct Replacement.

**DESIGN REQUIREMENTS**

PUMP PERFORMANCE: 300 GPM @ 45.5' TDH

DRIVE: 10HP, 1750 RPM, 460V, 3-PH, 60 Hz

IMPELLER DIAMETER: 7.125"

DISCHARGE PRESSURE: 15.5 – 16.0 PSI

SAFETY FACTOR: 1.0

**Pump:**

The output shall be 300 GPM @ 45.5' TDH

Pump shaft shall be heat treated steel with piloted motor mount

Pump standard finish shall be treated with solvent wash and single coat of Tnemec 27WB Epoxy (5-8 MDFT)

Pump seals shall have cartridge type with tungsten carbide faces

Pump bearings shall be oil bath lubricated ball type

Oil hose shall be supplied with an external protective jacket and a 90 degree barbed fitting

**Motor:**

Motor speed shall be 1750 RPM

Motor shall be 10 HP

Motor shall be electric with a 1.0 safety factor

Motor drive shall be explosion proof (Class 1, Group C & D) submersible motor rated for continuous in air operation

Motor shall be fully compatible and be able to function as intended when connected to the existing switchgear and infrastructure.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Aisha Niang (Phone # 832-395-5465).

**LINE ITEM NO. 63 - Pump, Chopper, Vertical Pedestal, to include External Cutter**

**Make: Vaughan**

**Model: PE4K6CS-070 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Chopper, Vertical Pedestal to include External Cutter**, for the **69<sup>TH</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to remove the excess process solids from the second step reactors.

VAUGHN MODEL#PE4K6CS-070 CHOPPER SUBMERSIBLE PUMP  
or City Approved Direct Replacement  
DESIGN REQUIREMENTS

RATED DUTY: 300 GPM @ 39.4' TDH @ 1750 RPM  
IMPELLER DIAMETER: 8.00"  
ELECTRIC DRIVE MOTOR: 10 HP  
DISCHARGE PRESSURE: 15.5 PSI  
MOTOR SPEED: 1750 RPM

**Pump:**

The output shall be 300 GPM @ 39.4' TDH @ 1750 RPM  
Impeller diameter shall be 8.00"  
Pump impeller, cutter nut & upper cutter shall be cast steel heat treated, to minimum 60 Rockwell "C" hardness.  
Impeller shall be dynamically balanced  
Pedestal base shall be 6" 150 lb. ANSI rated forged steel elbow.  
Suction size 6" and discharge 4"  
Pump casing shell be cast ductile iron with 4" 125 lb ANSI rated discharge flange

**Additions:**

Pump to include adder for external cutter (blade).

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first 3 months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Aisha Niang (Phone # 832-395-5465).

**LINE ITEM NO. 66 - Pump, Self-Priming Chopper Pump w/ Motor**

**Make: Vaughan**

**Model: SP4CB-089 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Self-Priming Chopper Pump w/ Motor**, for the **69<sup>th</sup> Street WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

Belt- Driven Self-Priming Chopper Pump  
Size 4" discharge 6" inlet  
Driven 15hp. motor  
Electric motor 230/460  
Mechanical Seal by Vaughan  
RPM belt drive 1900: motor RPM 1750

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

### **DELIVERY**

Entire assembled unit shall be delivered at COH's 69th Street Wastewater Treatment Plant, 2525 S/SGT Macario Garcia, Houston, TX 77020, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Daffy Burroughs 832-341-7175.

**LINE ITEM NO. 67 - Pump, Chopper Pump**

**Make: Vaughan**

**Model: P4K6CS-089 or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Chopper Pump**, for the **White Oak WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The pump specified here will be used to push scum building up within the clarifier towards the rotary screen for disposal.

**Pump:**

Performance Required: 200 GPM @ 26' TDH

Motor: 5 HP, 1170 RPM, 460V, 3PH, 60HZ, 1.15 SF "C" Flanged, TEFC, Electric Motor

Finish: Degreased & coated w/ acrylic epoxy paint

1080 Steel

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

**Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

**Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start up which ever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 68 - PUMP, SLUDGE CAKE PUMP**

Make: Moyno

**Model: 2000 Series 4J115G4 or City Approved Substitute**

**SUMMARY OF REQUIREMENT:**

Requirements for providing a Moyno cake pump for Almeda Sims Sludge Pump

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is city approved as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require replay an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PART TWO - PRODUCTS  
EQUIPMENT**

Moyno progressive cavity pump 4J115G4 CDQ-X 3ARA, Four Stage: default (vertical).  
Coupling, LS – Coupling; Low Speed  
GRDCPL, LS – Coupling Guard; Low Speed; OSHA.  
Design Flow; 48 GPM@ 200 PSI  
Pump Speed: 46.45 RPM  
Suction: 16" 125 LB. Flat Faced Flange  
Discharge: 8" 300 LB Raised Faced Flange  
Rotor: 4150 Alloy Steel with 0.10" hard chrome plate, Rc 57-60  
Stator: Nitrile  
Housing: Fabricated Steel  
Bearings: Tapered Roller, Grease Lubricated  
Shaft Steel: Braided & Split PTFE Packing with Graphite, Splite PTFE Lantern Ring  
Packing Gland: Cast Iron, Split Type  
Nameplate: Stainless Steel

**MOTOR**

Type: Baldor AC Motor  
HP: 20  
Frame: 256TC  
Phase/Cycle: 3/60  
Voltage: 460

RPM: 1750  
Duty: Continuous  
Service Factor: 1.15 (1.0 on VFD Duty 10-60 HZ Constant Torque)  
Insulation: Class H  
Enclosure: TEFC  
Assembly: F1  
Thermal Protection: Thermostats  
Other: Footless, Premium Efficient, Severe Duty, Inverter Duty, Canopy

### **GEAR REDUCER**

Type: Eurodrive Right Angle Reducer  
Model: K97AM256TC  
Ratio: 30.82:1  
Mounting Position: M4, Class 11  
Other: Footmounted, Output Shaft A

### **BASE**

Type: In-Line Carbon Steel Base

### **FLEXIBLE COUPLING**

Brand: Falk  
Model:1100T10

### **GALVONIZED COUPLING GUARD**

### **RUN DRY PROTECTION**

Type: Stator Temperature Assembly  
Controller: By Andritz  
Thermocouple Head  
Swage Nipple  
Thermocouple Type T  
Thermowell (factory installed in stator)

### **PART THREE - EXECUTION**

#### **Delivery**

Entire assembled unit shall be delivered at COH's Cullen Maintenance Facility at 7440 Cullen Houston TX, 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Aisha Niang, Engineer 832-395-5465.

#### **Tools and Spare Parts**

(4) Operations and Maintenance manuals.

Tools and Spare parts for at least one year.

#### **Warranty**

The manufacturer shall furnish the following to the owner:

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up, whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

**LINE ITEM NO. 69 PUMP, REBUILD KIT FOR MOYNO PUMP**

Make: Moyno

**Model: AS4945806 or City Approved Substitute**

**SUMMARY OF REQUIREMENT:**

Requirements for providing a Moyno pump rebuild kit for Almeda Sims Sludge Pump.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is a city approved direct replacement as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require replay an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PART TWO - PRODUCTS  
EQUIPMENT**

Rebuild Kit for a 4J115G4 CDQ-X 3ARA Moyno progressive cavity pump.

Two stator gasket parts 065/115, ARM N-8092.

Stator gasket K-size, ARM N-8092.

Stator housing assembly, 115, RM100, TMPPRB/CHF

Rotor assembly, 4J115G4, ASYSIL.

Two gear joint seals, J-size, NITRILE.

O-Ring, -162, NITRILE.

Two inspection gasket plates, G-size, NIT

Two gear joint kit, 4220120000, 2000-J size

Packing set, PKGSET (6) "J", 0.75X4.5 SFT

Two lantern ring assemblies, FRM J, TEFLON

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three months after pump acceptance.

### **Delivery**

Entire assembled unit shall be delivered at COH's Cullen Maintenance Facility at 7440 Cullen Houston TX, 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit. The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Aisha Niang, Engineer 832-395-5465.

### **Tools and Spare Parts**

Operations and Maintenance manuals.

Tools and spare parts for at least one year.

### **Warranty**

The manufacturer shall furnish the following to the owner:

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up, whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

**LINE ITEM NO. 70 - Pump, Accessories, Rotor**

Make: Moyno

**Model: 4241868007 or City Approved Substitute**

**SUMMARY OF REQUIREMENT:**

Requirements for providing rotor for Moyno 2000 model 4J115G4 Pump - Almeda Sims Sludge Pump.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is a city approved direct replacement as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require replay an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**EQUIPMENT REQUIREMENT**

Pump, Accessories, Rotor for Moyno Progressive Cavity Cake Pump 4J115G4 CDQ-X 3ARA  
Referenced Manufacturer: Moyno, Model No. 4241868007 or City approved.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three months after pump acceptance.

**Delivery**

Entire assembled unit shall be delivered at COH's Cullen Maintenance Facility at 7440 Cullen Houston TX, 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit. The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Aisha Niang, Engineer 832-395-5465.

### **Tools and Spare Parts**

Operations and Maintenance manuals.

Tools and spare parts for at least one year.

### **Warranty**

The manufacturer shall furnish the following to the owner:

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up, whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

**LINE ITEM NO. 71 - Pump, Accessories, Stator**

Make: Moyno

**Model: 4252001104 or City Approved Substitute**

**SUMMARY OF REQUIREMENT:**

Requirements for providing stator for Moyno 2000 model 4J115G4 Pump - Almeda Sims Sludge Pump.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is a city approved direct replacement as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require replay an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**EQUIPMENT REQUIREMENT**

Pump, Accessories, Stator for Moyno Progressive Cavity Cake Pump 4J115G4 CDQ-X 3ARA  
Referenced Manufacturer: Moyno, Model No. 4252001104 or City approved.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three months after pump acceptance.

**Delivery**

Entire assembled unit shall be delivered at COH's Cullen Maintenance Facility at 7440 Cullen Houston TX, 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit. The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with Aisha Niang, Engineer 832-395-5465.

### **Tools and Spare Parts**

Operations and Maintenance manuals.

Tools and spare parts for at least one year.

### **Warranty**

The manufacturer shall furnish the following to the owner:

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up, whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

**LINE ITEM NO. 72 - Pump, Recirculation, Polymer, (Pump Only),**

Make: Moyno

**Model: 4252001104 or City Approved Substitute**

**SUMMARY OF REQUIREMENT:**

Requirements for providing Pump, Recirculation, Polymer, (Pump Only), - Sims North Sludge Pump.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is a city approved direct replacement as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require replay an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**EQUIPMENT REQUIREMENT**

POLYMER RECIRCULATION PUMP ONLY, SS CONSTRUCTION, VITON RUBBER, NON-PLATED SHAFT & ROTOR, PACKING 3HP GEAR MOTOR 125RPM, 3PH/60HZ/230-460V

OPERATING SPEED (MAXIMUM): 125 RPM

HORSEPOWER: 3HP

PHASE: 3 PHASE

HERTZ: 60HZ

VOLTAGE: 230/460v

STAINLESS STEEL CONSTRUCTION

VITON RUBBER

NON PLATED SHAFT AND ROTOR

Pump, electric motor, and base shall be shop primed and finish painted at the place of manufacturer. Materials and thickness for priming shall be in accordance with manufacturer's standards.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three months after pump acceptance.

### **Delivery**

Entire assembled unit shall be delivered at COH's Cullen Maintenance Facility at 7440 Cullen Houston TX, 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit. The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with the COH contact listed on the Purchase Order.

### **Tools and Spare Parts**

Operations and Maintenance manuals.

Tools and spare parts for at least one year.

### **Warranty**

The manufacturer shall furnish the following to the owner:

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up, whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

**LINE ITEM NO. 73 - Pump, Accessories, Grinder**

Make: Moyno

**Model: CT203PEW9B2 or City Approved Substitute**

**SUMMARY OF REQUIREMENT:**

Requirements for providing **Pump, Accessories, Grinder** for **Beltway WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is a city approved direct replacement as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require replay an explanation at each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**EQUIPMENT REQUIREMENT**

Pump, Accessories, Grinder. Referenced Manufacturer: Moyno, Model No. CT203PEW9B2 or City approved.

**Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three months after pump acceptance.

**Delivery**

Entire assembled unit shall be delivered at COH's Cullen Maintenance Facility at 7440 Cullen Houston TX, 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit. The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with the COH Contact listed on the Purchase Order.

### **Tools and Spare Parts**

Operations and Maintenance manuals.

Tools and spare parts for at least one year.

### **Warranty**

The manufacturer shall furnish the following to the owner:

Unit shall be warranted against defects in materials and workmanship for a period of 18 months from shipment or 12 months from start-up, whichever is less, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

**LINE ITEM NO. 74 - Pump, Cavity Pump, Polymer**

**Make: Moyno**

**Model: B1FSSF3ABP-B or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Cavity Pump, Polymer**, for the **Sims North WWTP**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The vertical turbine pump specified in this section will be used to pump non-potable water from the chlorine contact basin to the sludge line.

POLYMER RECIRCULATION PUMP ONLY  
SS CONSTRUCTION  
VITON RUBBER  
NON-PLATED SHAFT & ROTOR  
PACKING INLCUDES .5HP GEAR MOTOR 146RPM, 3PH/90HZ/230-460V

OPERATING FLOW (Required): .55 GPM  
MOTOR: .5 HP, 230/460 V,146 RPM  
PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION

**PUMP CASING AND SUCTION HOUSING**

The bearing and suction housings of the pump shall be thick-walled cast iron. All cast parts shall be free of sand holes, blow holes, and other defects.

**ROTOR**

The rotor shall be Hard Chrome Plated Tool Steel or better with a nominal chrome plate thickness of.010 inches for maximum abrasion resistance. The rotor shall be a machined and polished.

**STATOR**

The stator shall be constructed of Nitrile Rubber with double helix configuration and shall be vulcanized in a metal tube and have a shore hardness of 70. The stator seals shall be designed to prevent the material being pumped from contacting the stator bonding and tube.

#### SUCTION AND DISCHARGE

The suction and discharge connections shall be 125 lb. or better flat face flanges with bolt whole dimensions and spacing to ANSI Standards.

#### BEARINGS

The bearings shall be sized to provide a minimum service life of 50,000 hours when operating at the rated capacity. The bearing housing shall be sealed with a double bearing seal on both sides of the cartridge housing, and the housing shall be so designed that it can be removed without dismantling the pump or suction piping.

#### GEAR JOINTS AND SHAFT ASSEMBLY

The gear joints shall be of the grease lubricated crowned gear type, totally enclosed and protected by a wire reinforced elastomeric seal. Mechanical components of the gear joints shall be designed to operate for a minimum of 10,000 hours at the manufacturer's published maximum speeds and pressures.

A rigid, splined connecting rod shall connect the gear joints of the drive shaft and eccentrically moving rotor. The connecting rod shall pass through the shaft seal area inside the hollow drive shaft quill so that no eccentric loads are imparted on the shaft seal area. The quill portion of the shaft shall be hard chrome plated.

The drive shaft shall be of one piece construction through the bearings and shaft seal area. This design shall permit disassembly of the universal joints without effecting the alignment of the shaft in the shaft sealing area. The bearings shall be of the grease lubricated, tapered roller bearing type with diverging pressure angles for maximum shaft stability. Bearings shall be designed for a minimum B-10 life of 30,000 hours under maximum operating conditions and shall not require periodic re-lubrication.

The bearings shall be protected from contaminants by means of a bearing cover plate bolted to the bearing housing. The pump shaft shall be manufactured of solid bar stock and shall be solid shaft design of chrome. The shaft shall also incorporate a plug-in arrangement allowing quick replacement of the rotating assembly through the gland area without disturbing the suction piping or pump driver. Disassembly shall be front-pull-out design, allowing rotor, both "U" joints, and shaft to be removed as one unit.

#### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

#### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

#### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of (1) year warranty from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

**DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact listed on the Purchase Order.

**LINE ITEM NO. 75 - Pump, Recirculation, Polymer, (Pump Only)**

**Make: Moyno**

**Model: 1000CC Series, B1FSSFABP-B or City Approved Equal**

**SUMMARY OF REQUIREMENT:**

Requirement for providing **Pump, Recirculation, Polymer, (Pump Only)**, for the **Almeda Sims Sludge Plant**.

GENERAL: The specifications herein state the minimum requirements of the *City of Houston*. All bids must be regular in every respect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The CITY may consider as "irregular" or "non-responsive", any bid not prepared and submitted in accordance with the bid documents and specification, or any bid lacking sufficient technical literature to enable the *City of Houston* to make a reasonable determination of compliance to the specification. It shall be the bidder's responsibility to carefully examine each item of the specification, failure to offer a completed bid or failure to respond to each section of the technical specification (exception yes or no) will cause the proposal to be rejected without review as "non-responsive". All variances, exceptions, and/or deviations shall be fully described in the appropriate section; deceit in responding to the specification will be cause for rejection.

EQUIVALENT PRODUCT: Bids will be accepted for consideration on any make and model that is equal to or superior to the currently installed equipment, as interpreted by the *City of Houston*. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence, but will require an explanation for each deviation or substitution.

INTERPRETATIONS: In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specifications documents or any part thereof. Every request for each a consideration shall be made in writing to the *City of Houston*. Based upon such inquiry, the *City of Houston* may choose to issue an Addendum in accordance with Local Public Contract Laws.

GENERAL SPECIFICATIONS: The unit shall be the current design requiring no modifications and have a record of being in regular sanitary sewer service for a minimum of five (5) years. The unit offered shall have a full stock of repair/replacement parts at a facility of the pump manufacturer within the CONUS (continental United States). A factory authorized repair facility that will make all factory warranty repairs shall be located within fifty (50) miles of City the Houston City Hall.

Bidders, on request of the *City of Houston*, must be prepared to review their specifications with the *City of Houston* and must, if requested. These services, if needed are considered as part of the bidder's proposal and will be provided without cost or obligation to the *City of Houston*.

**PRODUCT/Design Requirements:**

The vertical turbine pump specified in this section will be used to pump non-potable water from the chlorine contact basin to the sludge line.

POLYMER RECIRCULATION PUMP ONLY  
SS CONSTRUCTION  
VITON RUBBER  
NON-PLATED SHAFT & ROTOR  
PACKING INLCUDES 3HP GEAR MOTOR 125RPM, 3PH/60HZ/230-460V

OPERATING FLOW (Required): 15 GPM  
MOTOR: 3 HP, 230/460 V, 125 RPM

PUMP TO BE INSTALLED SHALL REQUIRE NO STRUCTURE AND/OR NO PIPING MODIFICATION

PUMP CASING AND SUCTION HOUSING

The bearing and suction housings of the pump shall be thick-walled cast iron. All cast parts shall be free of sand holes, blow holes, and other defects.

ROTOR

The rotor shall be Hard Chrome Plated Tool Steel or better with a nominal chrome plate thickness of .010 inches for maximum abrasion resistance. The rotor shall be a machined and polished.

## STATOR

The stator shall be constructed of Nitrile Rubber with double helix configuration and shall be vulcanized in a metal tube and have a shore hardness of 70. The stator seals shall be designed to prevent the material being pumped from contacting the stator bonding and tube.

## SUCTION AND DISCHARGE

The suction and discharge connections shall be 125 lb. or better flat face flanges with bolt whole dimensions and spacing to ANSI Standards.

## BEARINGS

The bearings shall be sized to provide a minimum service life of 50,000 hours when operating at the rated capacity. The bearing housing shall be sealed with a double bearing seal on both sides of the cartridge housing, and the housing shall be so designed that it can be removed without dismantling the pump or suction piping.

## GEAR JOINTS AND SHAFT ASSEMBLY

The gear joints shall be of the grease lubricated crowned gear type, totally enclosed and protected by a wire reinforced elastomeric seal. Mechanical components of the gear joints shall be designed to operate for a minimum of 10,000 hours at the manufacturer's published maximum speeds and pressures.

A rigid, splined connecting rod shall connect the gear joints of the drive shaft and eccentrically moving rotor. The connecting rod shall pass through the shaft seal area inside the hollow drive shaft quill so that no eccentric loads are imparted on the shaft seal area. The quill portion of the shaft shall be hard chrome plated.

The drive shaft shall be of one piece construction through the bearings and shaft seal area. This design shall permit disassembly of the universal joints without effecting the alignment of the shaft in the shaft sealing area.

The bearings shall be of the grease lubricated, tapered roller bearing type with diverging pressure angles for maximum shaft stability. Bearings shall be designed for a minimum B-10 life of 30,000 hours under maximum operating conditions and shall not require periodic re-lubrication. The bearings shall be protected from contaminants by means of a bearing cover plate bolted to the bearing housing.

The pump shaft shall be manufactured of solid bar stock and shall be solid shaft design of chrome. The shaft shall also incorporate a plug-in arrangement allowing quick replacement of the rotating assembly through the gland area without disturbing the suction piping or pump driver. Disassembly shall be front-pull-out design, allowing rotor, both "U" joints, and shaft to be removed as one unit.

### **Manufacturers/Vendor Services:**

The manufacturer shall furnish the services of a competent factory representative to do the following:

Inspect the system prior to delivery, supervise the City of Houston start up and testing of the system, and certify the system has been properly furnished and is ready for operation.

Instruct the owner's operating personnel in the proper operation and maintenance of the system for a period of not less than one half day.

Provide assistance to questions or follow-up training for the first three (3) months after pump acceptance.

### **Tools and Spare Parts**

The manufacturer shall provide the following to the owner:

At least (4) four copies of the Operations and Maintenance Manual.

### **Warranty**

Unit shall be warranted against defects in materials and workmanship for a period of one (1) year warranty from the date of final system acceptance, and shall cover 100% of parts and labor for the unit. Should the manufacturer's warranty exceed these requirements; the manufacturer's warranty shall be in effect. Warranty work shall be completed without cost to the City. It shall begin within 7 days after notification of the equipment failure or faulty material and shall be completed within a reasonable time frame, but not greater than 90 days. **All freight charges to and from the vendor's repair facility shall be borne by the seller during the warranty period.**

The vendor and/or the manufacturer shall allow the City the option to purchase an extended warranty.

## **DELIVERY**

Entire assembled unit shall be delivered at COH's Cullen Service Center, 7440 Cullen Blvd. Houston, Texas 77051, with sufficient capabilities of delivery vehicle to suitably off-load the assembled unit.

The assembled unit shall be packaged to prevent any damage to the unit during travel and off-loading.

The delivery company must coordinate with the appropriate City of Houston Staff to ensure the unit is off-loaded safely in the appropriate place and manner desired by the City of Houston.

Final Delivery details should also be coordinated with COH contact Mr. Ray Belton, Wastewater Operations Branch, Phone 713-562-4093.

## SECTION C

### GENERAL TERMS AND CONDITIONS

#### **1.0 COMPETITIVE BIDDING:**

- 1.1 It is the intent of the City of Houston to solicit the lowest and best responsible bid or price under competitive conditions. All materials and/or equipment shall be new unless stated otherwise. Prospective bidders are advised that the specifications within this bid invitation are not to be considered restricted to any referenced manufacturer.

#### **2.0 AWARD:**

- 2.1 The City reserves the right to consider and make awards of bids on articles of similar nature that will in all respects serve the purpose for which the purchase is being made. The City reserves the right to be the sole judge as to whether such articles will serve the purpose.
- 2.2 Unless otherwise specified, the City reserves the right to accept or reject in whole or in part any bid submitted or to waive any informalities that are in the best interests of the City.

#### **3.0 CONDITIONS PART OF BID:**

- 3.1 In the event of any conflict, the terms and provisions incorporated in the bid specifications shall control over the terms and provisions of the General Terms & Conditions for any or all purposes. Otherwise, all the terms and provisions appearing within the General Terms & Conditions shall be given full effect and shall be construed in harmony to the maximum extent by the parties hereto.
- 3.2 The failure of the City to insist, in any one or more instances, upon performance of any of the terms, covenants or conditions of this Contract, General Terms & Conditions or Specifications shall not be construed as a waiver or relinquishment of the future performance of such term, covenant or condition by the City, but the obligation of the Contractor with respect to such future performance shall continue in full force and effect.

#### **4.0 SILENCE OF SPECIFICATIONS:**

- 4.1 The apparent silence of these specifications as to any detail or the apparent omission from them of a detailed description concerning any point shall be regarded as meaning that only the best commercial practice shall prevail and only materials and workmanship of first quality are acceptable. All interpretations of these specifications shall be made upon the basis of this statement.

#### **5.0 SPECIFIED EQUIPMENT OR EQUIVALENT:**

- 5.1 Wherever in the specifications any materials or processes are indicated or specified by patent or proprietary name and/or by name of manufacturer, such specifications shall be deemed to be used for the purpose of facilitating descriptions of the performance, materials and/or processes desired and shall be deemed to be followed by the words, "or equivalent", if not so stated in the specifications herein.
- 5.2 The burden of proof shall rest with the bidder, in the course of a technical evaluation, to prove that the proposed item(s) are equivalent to the performance, materials, processes, or articles specified. DETERMINATION AS TO WHETHER THE ITEM (S) BID IS (ARE) EQUIVALENT TO THOSE SPECIFIED SHALL REST SOLELY WITH THE CITY PURCHASING AGENT AND THE RECEIVING DEPARTMENT.

**6.0 BRAND NAME OR TRADE NAME:**

6.1 Any manufacturer's names, trade names, brand names, or catalog numbers used in the specifications are for the purpose of describing and establishing the general quality level, design and performance desired. Such references are not intended to limit or restrict bidding by other Contractors/Suppliers, but are intended to approximate the quality design or performance that is desired. Any bid that proposes like quality, design or performance, will be considered. Equivalent products will be considered, provided a complete description and product literature is provided. Unless a specific exception is made, the assumption will be that the item bid is exactly as specified on the Invitation to Bid.

**7.0 PATENTS:**

7.1 The Contractor agrees to indemnify and save harmless the city, its agents, employees, officers, and legal representatives from all suits and actions of every nature and description brought against them or any of them, for or on account of the use of patented appliances, products or processes, and it shall pay all royalties and charges which are legal and equitable. Evidence of such payment or satisfaction shall be submitted, upon request of the City Purchasing Agent, as a necessary requirement in connection with the final estimate for payment in which such patented appliance, products or processes are used.

**8.0 TERMINATION OF AGREEMENT:**

8.1 By the City for Convenience:

8.1.1 The City Purchasing Agent may terminate this Contract at any time upon 30-calendar days notice in writing to the Contractor. Upon receipt of such notice, the Contractor shall, unless the notice directs otherwise, discontinue all services in connection with the performance of the contract and shall proceed to cancel promptly all existing orders and contracts insofar as such orders and contracts are chargeable to this Contract. As soon as practicable after the receipt of notice of termination, the Contractor shall submit a statement to the appropriate department(s) showing in detail the services performed or items delivered under this Contract to date of termination. The City agrees to compensate the Contractor for that portion of the prescribed charges for which the services were actually performed or items delivered under this contract and not previously paid.

8.2 By the City for Default by the Contractor:

8.2.1 In the event that the materials and/or services furnished by the Contractor do not conform to the standard set forth herein, or if the deliveries and servicing of this contract do not conform to the requirements detailed herein, the City through a written notice from the City Purchasing Agent to the Contractor describing such default may as its options:

- (1) Terminate the contract for default and the City shall have no further obligation under the Contract.
- (2) Allow the Contractor to cure default within a reasonable time as specified in the notice. The City, at its sole option, may extend the proposed date of termination to a later date. If prior to the proposed date of termination, the Contractor cures such default to the City's satisfaction, then the proposed termination shall be ineffective. If the Contractor fails to cure such default prior to the propose date of termination, then the City may terminate its performance under this contract as of such date and have no further obligation under the contract.

8.2.2 In the event of failure to deliver any or all of the items or to perform required services, the City may cover its loss by reasonably procuring from another source the items not delivered or the services not performed. The Contractor shall be responsible for and shall pay to the City immediately upon demand the difference in price between that offered by the Contractor and that which the City was forced to pay for covering the Contractor's failure to deliver or perform services.

8.3 By the Contractor for Default by City:

8.3.1 Default by the City shall occur if the City fails to perform or observe the terms and conditions of this Contract required to be performed or observed by the City, and the Contractor gives notice in writing to the City within 30 calendar days of the act or omission claimed by the Contractor to constitute default on the part of the City.

8.3.2 Upon receipt of such notice in writing from the Contractor, however, the City shall have 30 calendar days to cure such default. The Contractor, at its sole option, may extend the proposed date of termination to a later date.

8.3.3 If City cures such default prior to the proposed date of termination, the proposed termination shall be ineffective. If the City fails to cure such default prior to the proposed date of termination, then the Contractor may terminate its performance under this contract as of such date

## **9.0 SUCCESSORS & ASSIGNS:**

9.1 The Contractor may not assign this contract or dispose of substantially all of its assets without the written consent of the City Purchasing Agent. The Contractor's failure to obtain such consent shall be an event of default, authorizing the City Purchasing Agent to terminate this contract according to its terms.

## **10. RELEASE:**

**10.1 THE CONTRACTOR AGREES TO AND SHALL RELEASE THE CITY, ITS AGENTS, EMPLOYEES, OFFICERS, AND LEGAL REPRESENTATIVES (COLLECTIVELY THE "CITY") FROM ALL LIABILITY FOR INJURY, DEATH, DAMAGE, OR LOSS TO PERSONS OR PROPERTY SUSTAINED IN CONNECTION WITH OR INCIDENTAL TO PERFORMANCE UNDER THIS AGREEMENT, EVEN IF THE INJURY, DEATH, DAMAGE, OR LOSS IS CAUSED BY THE CITY'S SOLE OR CONCURRENT NEGLIGENCE AND/OR THE CITY'S STRICT PRODUCTS LIABILITY OR STRICT STATUTORY LIABILITY.**

## **11.0 INDEMNIFICATION:**

**11.1 THE CONTRACTOR AGREES TO AND SHALL DEFEND, INDEMNIFY, AND HOLD THE CITY, ITS AGENTS, EMPLOYEES, OFFICERS, AND LEGAL REPRESENTATIVES (COLLECTIVELY THE "CITY") HARMLESS FOR ALL CLAIMS, CAUSES OF ACTION, LIABILITIES, FINES, AND EXPENSES (INCLUDING, WITHOUT LIMITATION, ATTORNEYS' FEES, COURT COSTS, AND ALL OTHER DEFENSE COSTS AND INTEREST) FOR INJURY, DEATH, DAMAGE, OR LOSS TO PERSONS OR PROPERTY SUSTAINED IN CONNECTION WITH OR INCIDENTAL TO PERFORMANCE UNDER THIS AGREEMENT INCLUDING, WITHOUT LIMITATION, THOSE CAUSED BY:**

**(1) THE CONTRACTOR'S AND/OR ITS AGENTS', EMPLOYEES', OFFICERS', DIRECTORS', CONTRACTORS', OR SUBCONTRACTORS' (COLLECTIVELY IN NUMBERED PARAGRAPHS 1-3, "THE CONTRACTOR") ACTUAL OR ALLEGED NEGLIGENCE OR INTENTIONAL ACTS OR OMISSIONS;**

- (2) THE CITY'S AND THE CONTRACTOR'S ACTUAL OR ALLEGED CONCURRENT NEGLIGENCE, WHETHER THE CONTRACTOR IS IMMUNE FROM LIABILITY OR NOT; AND
- (3) THE CITY'S AND THE CONTRACTOR'S ACTUAL OR ALLEGED STRICT PRODUCTS LIABILITY OR STRICT STATUTORY LIABILITY, WHETHER THE CONTRACTOR IS IMMUNE FROM LIABILITY OR NOT.

11.2 THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE CITY HARMLESS DURING THE TERM OF THIS AGREEMENT AND FOR FOUR YEARS AFTER THE AGREEMENT TERMINATES. THE CONTRACTOR'S INDEMNIFICATION IS LIMITED TO \$500,000 PER OCCURRENCE. THE CONTRACTOR SHALL NOT INDEMNIFY THE CITY FOR THE CITY'S SOLE NEGLIGENCE.

11.3 **INDEMNIFICATION PROCEDURES:**

11.3.1 Notice of Claims. If the City or the Contractor receives notice of any claim or circumstances which could give rise to an indemnified loss, the receiving party shall give written notice to the other party within 10 days. The notice must include the following:

- (a) a description of the indemnification event in reasonable detail,
- (b) the basis on which indemnification may be due, and
- (c) the anticipated amount of the indemnified loss.

11.3.2 This notice does not stop or prevent the City from later asserting a different basis for indemnification or a different amount of indemnified loss than that indicated in the initial notice. If the City does not provide this notice within the 10 day period, it does not waive any right to indemnification except to the extent that the Contractor is prejudiced, suffers loss, or incurs expense because of the delay.

11.3.3 Defense of Claims.

- (a) Assumption of Defense. The Contractor may assume the defense of the claim at its own expense with counsel chosen by it that is reasonably satisfactory to the City. The Contractor shall then control the defense and any negotiations to settle the claim. Within 10 days after receiving written notice of the indemnification request, the Contractor must advise the City as to whether or not it will defend the claim. If the Contractor does not assume the defense, the City shall assume and control the defense, and all defense expenses constitute an indemnification loss.
- (b) Continued Participation. If the Contractor elects to defend the claim, the City may retain separate counsel to participate in (but not control) the defense and to participate in (but not control) any settlement negotiations. The Contractor may settle the claim without the consent or agreement of the City, unless it (i) would result in injunctive relief or other equitable remedies or otherwise require the City to comply with restrictions or limitations that adversely affect the City, (ii) would require the City to pay amounts that Contractor does not fund in full, (iii) would not result in the City's full and complete release from all liability to the plaintiffs or claimants who are parties to or otherwise bound by the settlement.

## 12.0 INSURANCE:

- 12.1 Contractor shall maintain in effect certain insurance coverage and shall furnish certificates of insurance, in duplicate form, before beginning its performance under this Agreement/purchase order. All policies except Professional Liability and Workers' Compensation must name the City as an additional insured. The issuer of any policy (1) shall have a Certificate of Authority to transact insurance business in Texas or (2) shall be an eligible non-admitted insurer in the State of Texas and have a Best's rating of at least B+ and a Best's Financial Size Category of Class VI or better, according to the most current edition Best's Key Rating Guide. Contractor shall maintain the following insurance coverage's in the following amounts:
- 12.1.1 Commercial General Liability insurance including Contractual Liability insurance:  
\$500,000 per occurrence; \$1,000,000 aggregate
  - 12.1.2 Workers' Compensation including Broad Form All States endorsement:  
Statutory amount
  - 12.1.3 Automobile Liability insurance  
\$1,000,000 combined single limit per occurrence  
Defense costs are excluded from the face amount of the policy.  
Aggregate Limits are per 12-month policy period unless otherwise indicated.
  - 12.1.4 Employer's Liability  
Bodily injury by accident \$100,000 (each accident)  
Bodily injury by disease \$100,000 (policy limit)  
Bodily injury by disease \$100,000 (each employee)
- 12.2 All insurance policies must require on their face, or by endorsement, that the insurance carrier waives any rights of subrogation against the City, Contractor shall give written notice to the Director if any of its insurance policies are cancelled, materially changed or non-renewed. Within the 30 day period, Contractor shall provide other suitable policies in lieu of those about to be canceled, materially changed, or non-renewed so as to maintain in effect the required coverage. If Contractor does not comply with this requirement, the Director, at his/her or sole discretion, may:
- 12.2.1 Immediately suspend Contractor from any further performance under this Agreement/purchase order and begin procedures to terminate for default, or
  - 12.2.2 Purchase the required insurance with City funds and deduct the cost of the premiums from amounts due to Contractor under this contract/purchase order.
  - 12.2.3 All certificates of insurance submitted by Contractor shall be accompanied by endorsements for additional insured coverage in favor of the City for Commercial General Liability and Automobile Liability policies; and waivers of subrogation in favor of the City for Commercial General Liability, Automobile Liability, and Worker's Compensation/Employers' Liability policies. For a list of pre-approved endorsement forms see <http://purchasing.houstontx.gov/forms.shtml>. The Director will consider all other forms on a case-by-case basis.

**INSURANCE IS NOT REQUIRED IF ITEM IS DROP-SHIPED BY MANUFACTURER OR IS DELIVERED BY COMMON CARRIER.**

### **13.0 MINORITY AND WOMEN BUSINESS ENTERPRISES:**

- 13.1 These provisions apply to goal-oriented contracts. A goal oriented contract means any contract awarded for the supply of goods or non-professional services of approximately \$100,000.00 for which competitive bids are required by law and which the City Purchasing Agent has determined to have City of Houston Certified MWBE subcontracting potential.
- 13.2 The Contractor agrees to comply with the City's Minority and Women Business Enterprise programs as set out in Chapter 15, Article V of the City of Houston Code of Ordinances insofar as such programs apply to this Contract. The Contractor further agrees that it will make good faith efforts to award subcontracts or supply agreements in at least 0% of the value of this Contract to Minority and Women-owned Business Enterprises certified by the City's Office of Business Opportunity. In addition, the Contractor acknowledges that it has reviewed the requirements for good faith efforts that are on file with the City's Office of Business Opportunity, is familiar with such requirements, and will comply with them.
- 13.3 The Contractor shall require written subcontracts with all MWBE subcontractors and suppliers, which must contain the terms, set out in the documents attached herein. If the Contractor is an individual person (as distinguished from a corporation, partnership, or other legal entity), and the amount of the subcontract is \$50,000 or less, then the subcontract must also be signed by the attorneys of the respective parties.
- 13.4 Refer to the "City of Houston Goal-Oriented Minority and Women Business Enterprises Contract Provisions" attachment, which is incorporated in the specifications herein by this reference for all purposes, for more detailed information on this requirement.

### **14.0 REJECTIONS:**

- 14.1 Articles not in accordance with samples and specifications must be removed by the Contractor and at its expense. All disputes concerning quality of supplies delivered under this offer will be determined by the City Purchasing Agent or designated representative.
- 14.2 All articles enumerated in the offer shall be subject to inspection on delivery by an officer designated for the purpose and if found inferior to the quality called for, or not equal in value to the Department's samples, or deficient in weight, measurements, workmanship or otherwise, this fact shall be certified to the City Purchasing Agent who shall have the right to reject the whole or any part of the same.

### **15.0 INVOICING:**

- 15.1 **In order to expedite payments all invoices must be submitted in triplicate, itemized as to quantity, part and/or model number, description in the same order and form as in the City of Houston Purchase Order. Variations will only delay payment. In addition, invoices must show the name of the Department, Division or Section to which the merchandise was delivered, and the City of Houston Purchase Order Number.**
- 15.2 **All delivery tickets must have a description of the item delivered.**
- 15.3 **Mail invoices to the Accounts Payable Section of the Department and to the address, as noted on individual purchase orders.**
- 15.4 **Delivery tickets and packing slips will contain the same information as the invoice.**
- 15.5 **All packing slips and delivery tickets must be signed by the receiving employee with their City Employee Number and must be signed by the Contractor's Representative.**

**16.0 TAXES:**

16.1 The City is exempt from the Federal Excise and Transportation Tax, and the limited Sales and Use Tax. Unless the Bid Form or Specifications specifically indicate otherwise, the bid price must be net exclusive of above-mentioned taxes. A Contractor desiring refunds of, or exemptions from, taxes paid on merchandise accepted by the City, must submit the proper forms, and the City Purchasing Agent, if satisfied as to the facts, may approve or issue the necessary certificates.

**17.0 PAYMENT:**

17.1 Payment is due thirty (30) days after the City has approved the invoice or after the City has accepted the equipment and all required documents, whichever occurs later. Invoices received that do not agree with the provisions set forth herein shall be returned for correction and will result in payment being delayed.

**17.2 PAYMENT OF SUBCONTRACTORS:**

17.2.1 The Contractor shall make time payments to all persons and entities supplying labor, materials or equipment for the performance of this Contract. The Contractor agrees to protect, defend, and indemnify the City from any claims or liability arising out of the Contractor's failure to make such payments. (Disputes relating to payment of MWBE subcontractors shall be submitted to arbitration in the same manner as any other disputes under the MWBE subcontract. Failure of the Contractor/ Supplier to comply with the decisions of the arbitrator may be deemed, at the sole discretion of the City, a material breach leading to termination of this Contract.)

**18.0 INSPECTIONS AND AUDITS:**

18.1 The City reserves all rights to review all payments made to the Contractors by auditing at a later date. Subject to such audit, any overpayment may be recovered from the Contractor.

18.2 City representatives may have the right to perform, or have performed, (1) audits of the Contractor's books and records, and (2) inspections of all places where work is undertaken in connection with this Agreement. The Contractor shall keep its books and records available for this purpose for at least four years after this Agreement terminates. This provision does not affect the applicable statute of limitations.

18.3 City representatives have the right to examine the books of all subcontractors and/or suppliers supplying goods and/or services under the contract insofar as those books and records relate to performance under the prime contract.

**19.0 CITY OF HOUSTON FAIR CAMPAIGN ORDINANCE:**

19.1 The City of Houston Fair Campaign Ordinance makes it unlawful for a Contractor to offer any contribution to a candidate for City elective office (including elected officers and officers-elect). All respondents to this invitation to bid must comply with Houston Code of Ordinances Chapter 18 as amended relating to the contribution and solicitation of funds for election campaigns. Provisions of this ordinance are provided in part in the paragraphs that follow. Complete copies may be obtained from the office of the City Secretary.

19.2 Candidates for city office may neither solicit nor receive contributions except during a period commencing 270 calendar days prior to an election date for which a person is a candidate for such office and ending 90 calendar days after the election date, including run off elections if such candidate is on the ballot.

- 19.3 Further, it shall be unlawful either for any person who submits a bid or proposal to contribute or offer any contribution to a candidate or for any candidate to solicit or accept any contribution from such person for a period commencing at the time of posting of the City Council Meeting Agenda including an item for the award of the Contract and ending upon the 30th day after the award of the Contract by City Council.
- 19.4 For the purposes of this Ordinance, a **Contract** is defined as each Contract having a value in excess of \$30,000 that is let by the City for professional services, personal services, or other goods or services of any other nature whether the Contract is awarded on a negotiated basis, request for proposal basis, competitive proposal basis or formal sealed competitive bids. The term **Contractor** includes proprietors of proprietorships, partners having an equity interest of 10% or more of partnerships, (including limited liability partnerships and companies), all officers and directors of corporations (including limited liability corporations), and all holders of 10% or more of the outstanding shares of corporations.
- 19.5 **A STATEMENT DISCLOSING THE NAMES AND BUSINESS ADDRESSES EACH OF THOSE PERSONS WILL BE REQUIRED TO BE SUBMITTED WITH EACH BID OR PROPOSAL FOR A CITY CONTRACT.** Completion of the attached form entitled "**Contractor Submission List**" will satisfy this requirement. Failure to provide this information may be just cause for rejection of your bid or proposal.

## **20.0 CITY OF HOUSTON CONTRACTOR OWNERSHIP DISCLOSURE ORDINANCE:**

- 20.1 City Council requires knowledge of the identities of the owners of entities seeking to contract with the City in order to review their indebtedness to the City and other qualifying governmental entities prior to entering into contracts. Therefore, all respondents to this invitation to bid must comply with Houston Code of Ordinances Chapter 15, as amended (Sections 15-122 through 15-126) relating to the disclosure of owners of entities bidding on, proposing for or receiving City contracts. Provisions of this ordinance are provided in part in the paragraphs that follow. Complete copies may be obtained from the office of the City Secretary.
- 20.2 Contracting entity means a sole proprietorship, corporation, non-profit corporation, partnership, joint venture, limited liability company, or other entity that seeks to enter into a contract requiring approval by the Council but excluding governmental entities.
- 20.3 A contracting entity must submit at the time of its bid or proposal, an affidavit listing the full names and the business and residence addresses of all persons owning 5% or more of a contracting entity or, where a contracting entity is a non-profit corporation, the full names and the business and residence addresses of all officers of the non-profit corporation.
- 20.4 Completion of the "**Affidavit of Ownership or Control**", included herein, and submitted with the Official Bid or Proposal Form will satisfy this requirement. Failure to provide this information with your bid or proposal may be just cause for rejection of your bid or proposal.

## 21.0 CHANGE ORDERS:

- 21.1 At any time during the Agreement Term, the City Purchasing Agent, or designated representative, may issue a change order to increase or decrease the scope of services, or change plans and specifications, as may be necessary to accomplish the general purposes of this Agreement. The Contractor shall furnish the services or deliverables in the change order in accordance with the requirements of this Agreement plus any special provisions, specifications, or special instructions issued to execute the additional work.
- 21.2 The Contractor shall not make any changes to the specifications or drawings contained herein without written authorization from the City Purchasing Agent or designated representative. The City may refuse to accept all or part of the work performed or equipment/supplies delivered if changes are made to the specifications or drawings without the written authorization of the City Purchasing Agent or designated representative. The City shall not be responsible for costs incurred by the Contractor on unauthorized change orders.
- 21.3 Documentation acceptable to the City Purchasing Agent as evidence of the Contractor's change(s) shall reference the City's bid specification by section(s) and page number(s). A letter with supporting documentation of the requested change(s) shall be submitted to the City Purchasing Agent, and the City Purchasing Agent must approve any requested changes **PRIOR TO ANY CHANGES BEING PERFORMED**. The face of the envelope containing this letter shall clearly state, "CHANGE ORDER REQUEST" and **THE NUMBER OF THE BID INVITATION AND THE NUMBER(S) OF THE PURCHASE ORDER(S) referenced**. Failure to provide clear and concise evidence as stated above and in the format requested will result in denial until the Contractor complies with these provisions. Documentation shall be mailed to:

City Purchasing Agent  
City of Houston, Finance Department  
Strategic Procurement Division  
P. O. Box 1562  
Houston, TX 77251-1562

- 21.4 The City Purchasing Agent, or designated representative, may issue change orders, subject to the following limitations:
- 21.4.1 City Council expressly authorizes the City Purchasing Agent to approve change orders of **\$50,000** or less. A change order of more than **\$50,000** over the approved contract amount must be approved by City Council.
- 21.4.2 The total of all change orders issued under this section may not increase the Original Agreement amount by more than 25%.
- 21.4.3 For any items described in a change order that the Contractor is otherwise required to provide under the Original Agreement, the City shall not pay additional money to the Contractor.