

**RESOLUTION NO. 25-277**

**A RESOLUTION TO AUTHORIZE THE APPROVAL OF THE ISSUANCE OF REQUEST FOR PROPOSALS (RFP) AND THE SOLICITATION OF SEALED QUOTATIONS FOR THE PICKETT'S RIDGE SEWER LIFT STATION IMPROVEMENTS PROJECT**

**WHEREAS**, the City of Spring Hill is responsible for maintaining the reliability of the municipal sewer collection system; and

**WHEREAS**, the Pickett's Ridge sewer lift station requires upgrades, including replacement of the existing pump package, installation of a new suction-lift pump package, bypass pump connections, and associated site work; and

**WHEREAS**, the City has prepared the Pickett's Ridge Sewer Lift Station Improvements RFP outlining the required scope of work and compliance standards; and

**WHEREAS**, the project requires demolition of existing pumps, piping, and related components (excluding the wet well, gravity lines, and electrical service entrance), as well as the installation and startup of the new pump system by a qualified contractor; and

**WHEREAS**, the City requires that all bidders comply with the RFP requirements, including, but not limited to: Drug-Free Workplace Affidavit, Certificate of Nondiscrimination, Title VI Compliance Survey, Certificate of Non-Illegal Immigrant Use, Certificate of Non-Collusion, and Insurance and Indemnification provisions; and

**WHEREAS**, issuance of the RFP and solicitation of sealed proposals is necessary to obtain competitive pricing and complete the project in accordance with City standards; and

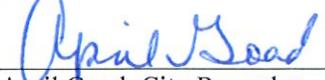
**WHEREAS**, funding will be allocated in Budget Amendment #2 by appropriating \$200,000 from previously budgeting capital in the Sewer Collections Division. The remaining \$121,000 will be appropriated from Spring Hill Water fund balance.

**NOW, THEREFORE, BE IT RESOLVED**, that the Board of Mayor and Aldermen of the City of Spring Hill hereby approve the issuance of the Request for Proposals and the solicitation of sealed quotations for the Pickett's Ridge Sewer Lift Station Improvements Project as described in the RFP documents.

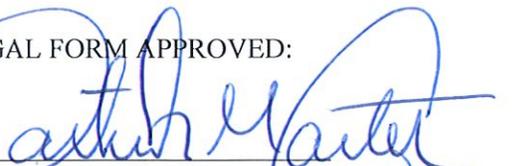
Passed and adopted the 1<sup>st</sup> day of December, 2025.

  
\_\_\_\_\_  
Matt Fitterer, Mayor

ATTEST:

  
\_\_\_\_\_  
April Goad, City Recorder

LEGAL FORM APPROVED:

  
\_\_\_\_\_  
Patrick Carter, City Attorney

## STAFF MEMORANDUM

**TO:** Board of Mayor and Aldermen

**FROM:** Dan Allen, ACA, GM Water; Ryan LaMunyon, AGM - Reclamation, Will Brasfield,  
SPARTAN Engineer

**DATE:** 11/25/2025

**SUBJECT:** Resolution 25-277 Authorization to Issue Request for Proposals — Pickett's Ridge Sewer Lift  
Station Improvements

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### **RECOMMENDATION:**

Staff recommends approval to issue the Request for Proposals (RFP) for the Pickett's Ridge Sewer Lift Station Improvements Project and to solicit sealed quotations from qualified contractors.

### **BACKGROUND:**

The City of Spring Hill is initiating improvements to the Pickett's Ridge sewer lift station to replace the existing pump package and install a new Prefabricated Engineered Suction Lift Pump Package as detailed in the project RFP (Pickett's Ridge RFP).

The project includes removal of the existing pump equipment and associated components, installation of the new pump package and controls, site work, electrical connections, and installation of bypass pump connections. Temporary bypass pumping will be required to maintain sewer operations during construction.

The contractor will be required to schedule site visits with the Assistant General Manager - Reclamation, submit shop drawings to Thomas & Hutton for review, and comply with all required forms and certifications included in the RFP package.

### **FINANCIAL IMPACT:**

Funding for this request will total \$321,000. The funding will include \$200,000 of previously budgeted capital in the Sewer Collection Division with the remaining \$121,000 coming from the Spring Hill Water fund balance.

### **SUPPORTING DOCUMENTS:**

Pickett's Ridge Sewer Lift Station Improvements RFP  
Required forms and specification documents included within the RFP package



City of Spring Hill  
Picketts Ridge Sewer Lift Station Improvements  
Estimated Construction Cost

Item Description	Estimated Quantity	Unit	Unit Cost	Item Cost
Demolition	1	LS	8,000.00	8,000.00
Bypass Pumping	1	LS	10,000.00	10,000.00
Bypass Assembly and Insertion Valve	1	LS	18,000.00	18,000.00
Suction Lift Pump Assembly	1	LS	127,500.00	127,500.00
Concrete Pad with Hatch	1	LS	8,000.00	8,000.00
Piping	1	LS	12,000.00	12,000.00
Painting	1	LS	5,000.00	5,000.00
Electrical	1	LS	15,000.00	15,000.00
SCADA	1	LS	35,000.00	35,000.00
Site Cleanup	1	LS	3,500.00	3,500.00
			<b>Subtotal</b>	<b>242,000.00</b>
Contingency @ 20%	1	LS	49,000.00	49,000.00
			<b>Total</b>	<b>291,000.00</b>



## **LEGAL NOTICE**

### **INVITATION TO SUBMIT PROPOSALS**

The City of Spring Hill will accept quotations for the **installation** of the new Pre-Fabricated Engineered Suction Lift Pump Package withing the existing sewer lift station, located at Pickett's Ridge. Bidders shall submit sealed quotations in the format specified in the Invitation to Submit Quotations no later than **TBD** at which time bids will be publicly opened and read aloud. No bid may be withdrawn after the scheduled closing time for a period of 90 days. Bidding documents may be obtained at Spring Hill City Hall during regular business hours or [www.springhilltn.org](http://www.springhilltn.org). Quotations should be mailed or hand delivered to:

April Goad, City Recorder  
City of Spring Hill  
**Sealed Bid: Pickett's Ridge Sewer Lift Station Improvements / TBD**  
199 Town Center Parkway (*for hand delivery or courier services*)  
P.O. Box 789 (*for regular mailing services*)  
Spring Hill, TN 37174

The City of Spring Hill will not discriminate in the purchase of all goods and services based on race, color, religion, sex, national origin, age, disability or any other lawfully protected classification.

Verbal quotations and quotations received after the closing date and time will not be accepted. The City of Spring Hill reserves the right to reject any, and all, bids to waive technicalities or informalities and to accept any bid deemed to be in the best interest of the City.

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Non-Collusion

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**SECTION I - GENERAL INFORMATION**

A. The City of Spring Hill is requesting proposals for the furnishing and installation of a new Pre-Fabricated Engineered Suction Lift Pump Package withing the existing sewer lift station, including all accessories and appurtenances, for the upgrade of the existing Pickett’s Ridge sewer lift station. This installation includes demolition of the existing pump package, site work, bypass pumping connection installation, and installation of the new pump package.

Owner: Spring Hill City Hall  
199 Town Center Parkway  
P.O. Box 789  
Spring Hill, TN 37174

Contact: Jessica Weaver, Utility Director  
3893 Mahlon Moore Rd  
Spring Hill, TN 37174

Questions are to be directed to Jessica Weaver via E-mail: [jweaver@springhilltn.org](mailto:jweaver@springhilltn.org). Questions must be in writing and not verbal. All questions and clarifications will be reviewed and answered via an addendum which will be published on the City’s website prior to bid date.

- B. The City of Spring Hill reserves the right to reject any, and all bids, to waive technicalities or informalities and to accept any bid deemed to be in the best interest of the City. Bids may not be withdrawn after scheduled closing time for a 90-day period.
- C. The bidder shall abide by and comply with the true intent of the specifications and not take advantage of any unintentional error or omission but shall fully address the full intent and meaning of each aspect of the specifications.
- D. All forms shall be completed and included as an integral part of each bidder’s proposal.
- E. Freight shall be paid by the contractor and should be included in the unit price bid.
- F. The City is a tax-exempt organization.
- G. Mail is delivered after 4:00 p.m. Monday through Friday.

**SECTION II – PROPOSAL REQUIREMENTS**

Scope: Demolition of existing pumps, piping, and accessories within the station (excluding existing wet well, gravity lines, and electrical service entrance) to install the new Pre-Fabricated Engineered Suction Lift Pump Package. The contractor shall provide all necessary items and appurtenances for a complete installation. Installation of bypass pump connections per plans and specs. The replacement

shall be scheduled during a low flow period as directed and approved by Jessica Weaver. Temporary bypass pumping shall be provided by the contractor to maintain sewer operations. Bypass pumps shall be in place and sized accordingly to accommodate peak flows for the duration of the project. All measurements shall be confirmed by the contractor by performing scheduled site visit(s) through Jessica Weaver.

Site visits shall be scheduled through, and approved by, Jessica Weaver (Utility Director); (615) 281-2886 or [jweaver@springhilltn.org](mailto:jweaver@springhilltn.org). During the time of 8:00 am – 11:00 am and 1:00 pm – 3:00 pm, M-F for the two-week period TBD.

### **SECTION III – SPECIFICATION COMPLAINT**

The lump sum price quoted shall include removal of the existing pump equipment and all its components and accessories and installation of the new pump package and accessories, including controls, electrical, piping, connections, bypass pumping and all necessary accessories, material and equipment.. The lump sum price quoted shall also include a complete installation and startup of all equipment, specified herein, for the Pickett’s Ridge Sewer Lift Station Improvements by a competent and experienced contractor. Shop drawings shall be submitted to the City’s consultant Thomas and Hutton (Ryan Chamblee, P.E., [chamblee.r@tandh.com](mailto:chamblee.r@tandh.com) (629) 900-4906) for review and approval prior to installation of the equipment.

No bidder may withdraw a bid for a period of ninety (90) days after bids have been opened. The City has the right to reject any/and all bids or to waive all technicalities. The Contractor’s Name and Address must be placed on the envelope containing their proposal, otherwise the bid will not be opened.

ERROR IN BID - in case of error in the prices in the bid, the written price will govern. No bid shall be altered, amended, or withdrawn after specified time for opening bids. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

SPECIFICATIONS - it is understood that reference to specifications shall be sufficient to make the terms of such specifications binding on the supplier/bidder. In addition to the attached technical specifications and drawings, the contractor shall adhere to the Spring Hill Standard Specifications for Sewage Additions, which can be found on the City’s website at <https://www.springhilltn.org/DocumentCenter/View/11057/Approved-Sewer-Specifications-6-26-24>

#### **PROPOSAL BID ITEM:**

All equipment and materials shall be installed per the manufacturer’s standards.

Bid Proposal

<b>TOTAL INSTALLATION-LUMP SUM-BID COST</b> (Written Bid in words) _____ _____	\$ _____ _____
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In compliance with the conditions stated above and attached specifications and conditions, the undersigned offers, and agrees, if this bid is accepted within 90 days from opening date, to furnish and deliver all items at the prices set above.

OWNER CITY OF SPRING HILL

CONTRACTOR \_\_\_\_\_

By: \_\_\_\_\_  
Mayor

By: \_\_\_\_\_

Attest: \_\_\_\_\_  
City Clerk

Attest: \_\_\_\_\_

Address for giving notices P.O. Box 789  
Spring Hill, TN 37174

Address for giving notices  
\_\_\_\_\_  
\_\_\_\_\_  
Agent for service to process:



AFFIDAVIT

**STATE OF TENNESSEE DRUG-FREE WORKPLACE AFFIDAVIT**

**COUNTY OF \_\_\_\_\_ OF PRIME BIDDER**

NOW COMES AFFIANT, who being duly sworn, deposes and says:

1. He/She is the principal officer for \_\_\_\_\_;
2. That the bidding entity has submitted a bid to the City of Spring Hill for the construction of \_\_\_\_\_;
3. That the bidding entity employs no less than five (5) employees;
4. That Affiant certifies that the bidding entity has in effect, at the time of submission of its bid to perform the construction referred to above, a drug-free workplace program that complies with §50-9-113, *Tennessee Code Annotated*;
5. That this affidavit is made on personal knowledge.

Further Affiant saith not.

\_\_\_\_\_  
AFFIANT

SUBSCRIBED AND SWORN TO before me this \_\_\_\_\_ day of \_\_\_\_\_,  
20\_\_.

\_\_\_\_\_  
NOTARY PUBLIC

My Commission expires: \_\_\_\_\_

### **50-9-113. State and local government construction contracts.**

- (a) Each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services or who is awarded a contract to provide construction services or who provides construction services to the state or local government shall submit an affidavit stating that such employer has a drug-free workplace program that complies with this chapter, in effect at the time of such submission of a bid at least to the extent required of governmental entities. Any private employer that certifies compliance with the drug-free workplace program, only to the extent required by this section, shall not receive any reduction in workers' compensation premiums and shall not be entitled to any other benefit provided by compliance with the drug-free workplace program set forth in this chapter. Nothing in this section shall be construed to reduce or diminish the rights or privileges of any private employer who has a drug-free workplace program that fully complies with this chapter. For purposes of compliance with this section, any private employer shall obtain a certificate of compliance with the applicable portions of the Drug-free Workplace Act from the department of labor and workforce development. No local government or state governmental entity shall enter into any contract or award a contract for construction services with an employer who does not comply with the provisions of this section.
- b) For the purposes of this section, "employer" does not include any utility or unit of local government. "Employer" includes any private company and/or corporation.
- (c) If it is determined that an employer subject to the provisions of this section has entered into a contract with a local government or state agency and such employer does not have a drug-free workplace pursuant to this section, such employer shall be prohibited from entering into another contract with any local government or state agency until such employer can prove compliance with the drug-free workplace program pursuant to this section. If the same employer again contracts with any local government or state agency and does not have a drug-free workplace program pursuant to this section, then such employer shall be prohibited from entering into another contract with any local government or state agency for not less than three (3) months from the date such violation was discovered and verified and shall be prohibited from entering into another contract until such employer complies with the drug-free workplace program pursuant to this section. If the same employer for a third time contracts with any local government or state agency and does not have a drug-free workplace program pursuant to this section, then such employer shall be prohibited from entering into another contract with any local government or state agency for not less than one (1) year from the date such violation was discovered and verified and shall be prohibited from entering into another contract until such employer complies with the drug-free workplace program pursuant to this section.
- (d) A written affidavit by the principal officer of a covered employer provided to a local government at the time such bid or contract is submitted stating that the employer is in compliance with this section shall absolve the local government of all further responsibility under this section and any liability arising from the employer's compliance or failure of compliance with the provisions of this section.

[Acts 2000, ch.918, §§ 1,2.]

**CITY OF SPRING HILL, TENNESSEE**

**INDEMNIFICATION AGREEMENT**

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(NAME OF CONTRACTING COMPANY)

agrees to indemnify and save, the Government of Spring Hill; the City of Spring Hill; Thomas & Hutton; and sub-consultants working under Thomas & Hutton; on or off duty, officers, and employees of the City of Spring Hill; Thomas & Hutton; and sub-consultants working under Thomas & Hutton, harmless from any and all losses, damages and expenses, including court costs and attorney's fees, by reason of any loss, whatsoever, arising out of or in consequence of the work done in connection with the contract of which this Agreement is a part, excepting only such losses as shall be occasioned solely by the negligence of the City of Spring Hill; Thomas & Hutton; and those sub-consultants working under Thomas & Hutton, on this project.

The contractor further agrees to protect, defend, and save the City its elected and appointed officials, agents, employees and volunteers while working in the scope of their duties as such, harmless from and against all claims, demands, and causes of action of any kind or character, including the cost of their defense, arising in favor of the contractor's employees or third parties on account of bodily or personal injuries, death or damage to property arising out of services performed or omissions of services or in any way resulting from the acts or omissions of the contractor and/or its agents, employees, subcontractors, representative or the City under this agreement.

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Company

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Title

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Date



CITY OF SPRING HILL CONSTRUCTION CONTRACT

CERTIFICATE OF NONDISCRIMINATION

As Bidder, Contractor, or Subcontractor on City of Spring Hill Construction Project,

- 
1. the undersigned states that he does not discriminate against any subcontractor, employee or applicant for employment on the grounds of race, color, national origin or sex and, if awarded a contract for this project, agrees in performance of work:
  2. not to discriminate against any subcontractor, employee, or applicant for employment on the grounds of race, color, national origin or sex;
  3. to maintain payrolls of laborers and mechanics employed on this contract until 90 days after final release and final payment by the City;
  4. require a similar certificate to be executed by each subcontractor at the time a subcontractor is executed under the contract with the requirement that such subcontractor agrees to require a similar certificate of requirement on any lower tier of subcontractors.

Contractor's Name \_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_

Printed or typed name and title



CITY OF SPRING HILL

TITLE VI COMPLIANCE SURVEY

The City of Spring Hill intends to fully comply with the Tennessee Department of Transportation's policy regarding TITLE VI of the CIVIL RIGHTS ACT of 1964; 49 CFT, PART 21; related statutes and regulations to the end that no person shall be excluded from participation in or be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance from the U.S. Department of Transportation on the grounds of race, color, gender, age, disability or national origin.

Please complete the following information:

NAME OF COMPANY \_\_\_\_\_

NAME OF OWNER/CONTRACTOR: \_\_\_\_\_

ADDRESS OF OWNER/CONTRACTOR: \_\_\_\_\_

COUNTY: \_\_\_\_\_

TYPE OF SERVICES PROVIDED: \_\_\_\_\_

CONTRACT: \_\_\_\_\_

OWNER/CONTRACTOR  
(Race/Gender)

White Male \_\_\_\_\_  
White Female \_\_\_\_\_  
African-American Male \_\_\_\_\_  
African-American Female \_\_\_\_\_  
Hispanic Male \_\_\_\_\_  
Hispanic Female \_\_\_\_\_  
Native American Male \_\_\_\_\_  
Native American Female \_\_\_\_\_  
Asian-American Male \_\_\_\_\_  
Asian-American Female \_\_\_\_\_  
Other \_\_\_\_\_ Male \_\_\_\_\_  
Other \_\_\_\_\_ Females \_\_\_\_\_

EMPLOYEES  
(Number in each category)

White Males \_\_\_\_\_  
White Females \_\_\_\_\_  
African-American Males \_\_\_\_\_  
African-American Females \_\_\_\_\_  
Hispanic Males \_\_\_\_\_  
Hispanic Females \_\_\_\_\_  
Native American Males \_\_\_\_\_  
Native American Females \_\_\_\_\_  
Asian-American Males \_\_\_\_\_  
Asian-American Females \_\_\_\_\_  
Other \_\_\_\_\_ Males \_\_\_\_\_  
Other \_\_\_\_\_ Females \_\_\_\_\_



**City of Spring Hill**  
**Assurance of Compliance Under Title VI of the Civil Rights Act of 1964**

Name of Applicant (hereby referred to as "The Applicant") \_\_\_\_\_

Hereby agrees that it will comply with Title VI of the Civil Rights Act of 1964 (P.L. 88-352) and all requirements imposed by the Regulations of the U.S. Department of Justice (28 CFR Parts 42 & 50) and the City of Spring Hill, and any directives or regulations issued pursuant to that Act and the Regulations, to the effect that, no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program or activity for which the Applicant received Federal financial assistance from the City and HEREBY GIVES ASSURANCE THAT it will immediately take any measures necessary to effectuate this agreement.

THIS ASSURANCE is given in consideration of and for the purpose of obtaining any and all Federal financial assistance, grants and loans of Federal funds, reimbursable expenditures, grant or donation of Federal property and interest in property, the detail of Federal personnel, the sale and lease of, and the permission to use, Federal property or interest in such property or the furnishing of services without consideration or at a nominal consideration, or at a consideration which is reduced for the purpose of assisting the recipient, or in recognition of the public interest to be served by such sale, lease, or furnishing of services to the recipient, or any improvements made with Federal financial assistance extended to the Applicant by the City.

BY ACCEPTING THIS ASSURANCE, the applicant agrees to compile data, maintain records, and submit reports as required to permit effective enforcement of Title VI, and permit authorized City personnel during normal working hours to review such records, books, and accounts as needed to ascertain compliance with Title VI. If there are any violations of this assurance, the City shall have the right to seek administrative and/or judicial enforcement of this assurance.

This assurance is binding on the applicant, its successors, transferees, and assignees as long as it receives assistance from the City. IN the case of real property, this assurance is binding for as long as the property is used for a purpose for which this assistance was intended or for the provision of services or benefits similar to those originally intended. In the case of personal property, this assurance applies for as long as the recipient retains ownership or possession of the property. The person or persons whose signatures appear below are authorized to sign this assurance on the behalf of the applicant.

Dated \_\_\_\_\_

\_\_\_\_\_  
(Applicant)

Address \_\_\_\_\_  
\_\_\_\_\_

By \_\_\_\_\_  
(Title of Authorized Official)

No further monies or other benefits may be paid out under these programs unless this Assurance is completed and filed as required by existing regulations.



## CERTIFICATE OF NON-ILLEGAL IMMIGRANT USE

As Bidder, Contractor, or Subcontractor on City of Spring Hill Construction Project,

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1. the undersigned states that he does not knowingly utilize the services of **illegal immigrants** in the performance of a contract for goods or services entered into with the City of Spring Hill:
2. and will not knowingly utilize the services of any subcontractor who will utilize the services of **illegal immigrants** in the performance of the contract;
3. If any person who contracts to supply goods or services to the City of Spring Hill or who submits a bid to contract to supply goods or services to the state or other state entities, is discovered to have knowingly utilized the services of **illegal immigrants** in the performance of the contract to supply goods or services to the City of Spring Hill, the City of Spring Hill shall declare that person to be prohibited from contracting for or submitting a bid for any contract to supply goods or services to the City of Spring Hill for a period of one (1) year from the date of discovery of the usage of **illegal** immigrant services in the performance of a contract to supply goods or services to the City of Spring Hill

Contractor's Name \_\_\_\_\_  
\_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_

Title \_\_\_\_\_



## CERTIFICATE OF NON-COLLUSION

As Bidder, on a City of Spring Hill Construction Project:

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the undersigned hereby declares that no person or party other than the undersigned has any interest whatever in the submitted bid proposal, that it is without any connection or collusion with any person or persons making or having made any proposal for the same work and without any previous understanding with such person or persons as to relative prices, obviating competition, and that it is made in good faith.

Contractor's Name \_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_  
\_\_\_\_\_

Title \_\_\_\_\_

# CITY OF SPRING HILL CONSTRUCTION CONTRACT SPECIFICATION REQUIREMENTS AND COMPLIANCE

**Indemnity requirement:**

The contractor further agrees to protect, defend, and save the City its elected and appointed officials, agents, employees and volunteers while working in the scope of their duties as such, harmless from and against all claims, demands, and causes of action of any kind or character, including the cost of their defense, arising in favor of the contractor's employees or third parties on account of bodily or personal injuries, death or damage to property arising out of services performed or omissions of services or in any way resulting from the acts or omissions of the contractor and/or its agents, employees, subcontractors, representative or the City under this agreement.

**Compliance with laws:**

The contractor must comply with all applicable federal and state law including the prevailing wage laws. Contractor must provide adequate proof of insurance with the bid.

**Insurance requirements:**

The contractor shall procure and maintain for the duration of the contract, at his/her own cost and expense, insurance against claims for injuries to persons or damages to property including contractual liability that may arise in connection with the performance of the work by the contractor, his agents, representatives, employees or subcontractors under this agreement. The insurance carrier(s) must be licensed to conduct business in the State of Tennessee. The insurance will be evidenced by certificates of insurance. The certificate shall include wording that states the City will be notified thirty days prior to cancellation of the coverage or a major change in the coverage provided. The contractor will either verify the listed coverage(s) for all subcontractors hired by the contractor to assist with the project, or the contractor will assume total financial responsibility for uninsured claims of the subcontractor. The City shall be held harmless for any injuries, claims or judgments against the subcontractor. Certificates for liability coverages shall name the City as an "additional insured". The following coverages will be required:

**Workers' compensation:** a certificate shall be provided that indicates the contractor provides workers' compensation coverage in compliance with the state laws of Tennessee.

General Liability:

- |   |             |
|---|-------------|
| 1. Bodily injury or death - each occurrence | \$1,000,000 |
| 2. Bodily injury or death - aggregate       | 1,000,000   |
| 3. Property damage - each occurrence        | 500,000     |
| 4. Property damage - aggregate              | 500,000     |
| 5. Personal injury - aggregate              | 500,000     |

This insurance shall indicate on the certificate of insurance the following coverages:

Broad Form Contractual  
Independent Contractor and sub-contractors  
Premises-Operations

Automobile Liability (including owned, hired, and non-owned):

- |   |             |
|---|-------------|
| 1. Bodily injury or death - each person     | \$1,000,000 |
| 2. Bodily injury or death - each occurrence | 1,000,000   |
| 3. Property damage - each occurrence        | 500,000     |

This insurance shall include bodily injury and property damage for the following coverages:

Owned automobiles  
Hired automobiles  
Non-owned automobiles

## **SPRING HILL BUSINESS LICENSE**

Subject to the exceptions enumerated hereinafter, persons subject to the Spring Hill Business Tax operating from an established place of business in one county who extend their operations into other counties and/or municipalities without establishing an office, headquarters or other place of business therein shall not be subject to the Spring Hill Business Tax in such other counties and/or municipalities. Tax on total receipts from all taxable sales shall be due to the county and municipality, if any, in which the established place of business is located. If applicable, at license expiration, renewal is a percentage of the business total gross.

Excepted from the rule as stated in above paragraph are:

- (a) Persons with no established place of business in this state.
- (b) Contractors with taxable receipts of \$50,000 and out of state contractors.

## **APPLICABLE LAW**

The contract shall be governed in all respects by the laws of Tennessee, and any litigation with respect thereto shall be brought in the courts of Tennessee. The contractor shall comply with applicable federal, state, and local laws and regulations.

Please note that any and all documents submitted to the City of Spring Hill that are associated with this project are subject to the Tennessee Public Records Act. Access to the record is governed by the Tennessee Public Records Act and the policies of the City of Spring Hill and the Office of Open Records Counsel.

**SPECIFICATIONS COMPLIANCE**

Unless otherwise noted, all quotations for City of Spring Hill, **SOUTHSIDE 2.0 MG WATER STORAGE TANK** shall be in complete accordance with the specifications detailed herein. Bidders shall note in the space provided below any exceptions or deviations in any way from the specifications of any section of the project documents. Bidders should provide complete detail of exceptions or deviations.

Proposal Exceptions

<u>Section</u>	<u>Brief Description</u>
_____	_____
_____	_____
_____	_____
_____	_____

By signature below, vendor acknowledges any quotation to be in full compliance with all aspects of each section of the project documents not noted above. The undersigned hereby declares that no person or party other than the undersigned have any interest whatever in this proposal, that it is without any connection or collusion with any person or persons making or having made any proposal for the same work and without any previous understanding with such person or persons as to relative prices, obviating competition, and that it is made in good faith.

\_\_\_\_\_  
COMPANY

\_\_\_\_\_  
FAX NUMBER

\_\_\_\_\_  
REPRESENTATIVE NAME & TITLE

\_\_\_\_\_  
TELEPHONE NUMBER

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
E-MAIL ADDRESS

**SPECIFICATIONS AND EXHIBITS**

## FACTORY-BUILT 6X6 ABOVE GROUND PUMP STATION WITH DUPLEX SELF-PRIMING PUMPS

### PART - GENERAL

1.01 Work under this section includes, but is not limited to furnishing and installing a factory built duplex pump station as indicated on the project drawings, herein specified, as necessary for proper and complete performance.

1.02 Publications listed below form part of this specification to extent referenced in the text by basic designation only. Consult latest edition of publication unless otherwise noted.

- A. American National Std. Institute (ANSI) / American Water Works Assoc. (AWWA)
  - 1. ANSI B16.1 Cast iron pipe flanges and flanged fittings.
  - 2. ANSI/AWWA C115/A21.51 Cast/ductile iron pipe with threaded flanges.
  - 3. ANSI 253.1 Safety Color Code for Marking Physical Hazards.
  - 4. ANSI B40.1 Gages, Pressure and Vacuum.
  - 5. AWWA C508 Single Swing Check Valves.
  
- B. American Society for Testing and Materials (ASTM)
  - 1. ASTM A48 Gray Iron Castings.
  - 2. ASTM A126 Valves, Flanges, and Pipe Fittings.
  - 3. ASTM A307 Carbon Steel Bolts and Studs.
  - 4. ASTM A36 Structural Steel.
  
- C. Institute of Electrical and Electronics Engineers (IEEE)
  - 1. IEEE Std 100 Standard Dictionary of Electrical Terms.
  - 2. IEEE Std 112 Test Procedure for Polyphase Induction Motors.
  - 3. IEEE Std 242 Protection of Industrial and Control Power Systems.
  
- D. National Electric Code (NEC) / National Electrical Manufacturers' Assoc. (NEMA)
  - 1. NEC National Electrical Code.
  - 2. NEMA Std MG1 Motors and Generators.
  
- E. Miscellaneous References
  - 1. Ten-State Standards Recommended Standards for Sewage Works.
  - 2. Hydraulic Institute Std for Centrifugal, Rotary and Reciprocating Pumps.
  - 3. ISO 9001 International Organization for Standardization.
  - 4. ISO 14001 International Organization for Standardization.

### 1.03 SYSTEM DESCRIPTION

- A. Design requirements consist of factory built pump station design, including materials of construction, pump features, valves and piping, and motor controls shall be in accordance with requirements listed under PART 2 - PRODUCTS of this section.
  - 1. Contractor shall furnish and install one factory built above ground, automatic pump station. The station shall be complete with all equipment specified herein, factory assembled in a fiberglass reinforced polyester resin enclosure.
  - 2. In addition to the station enclosure, principle items of equipment shall include two horizontal, self priming, centrifugal sewage pumps, V-belt drives, motors, internal

pipng, valves, motor control panel, automatic liquid level control system, and internal wiring.

B. Performance Criteria

1. Pumps must be designed to handle raw, unscreened, domestic sanitary sewage. Pumps shall have 3 " suction connection, and 3 " discharge connection. Each pump shall be selected to perform under following operating conditions:

a. Capacity (GPM)	<u>180</u>
b. Total Dynamic Head(FT)	<u>70'</u>
c. Total Dynamic Suction Lift(FT)	<u>          </u>
d. Maximum Repriming Lift(FT)	<u>          </u>
e. Maximum Static Suction Lift(FT)	<u>          </u>
f. Total Discharge Static Head(FT)	<u>          </u>
g. Minimum Submergence Depth (FT)	<u>          </u>

C. Utility Power Requirements

1. Site power furnished to pump station shall be 3 phase, 60 hertz, 460 volts,        wire, maintained within industry standards. The available fault current provided at the pump station control panel is 10 kA rms symmetrical. Voltage tolerance shall be plus or minus 10 percent. Phase-to-phase unbalance shall not exceed 1% average voltage as set forth in NEMA Standard MG-1. Control voltage shall not exceed 132 volts.

1.04 SUBMITTALS

A. Product Data

1. Prior to fabrication, pump station manufacturer shall submit 1 copy of submittal data for review and approval.
2. Submittal shall include shop drawings, electrical ladder logic drawings, and support data as follows: Catalog cuts sheets reflecting characteristics for major items of equipment, materials of construction, major dimensions, motor and v-belt drive data, pump characteristic curves showing the design duty point capacity (GPM), head (FT), net positive suction head required (NPSHr), and hydraulic brake horsepower (BHP). Electrical components used in the motor branch and liquid level control shall be fully described.

B. Shop Drawings

1. Shop drawings shall provide layout of mechanical equipment and anchor bolt locations for station. Pipe penetrations and station access clearances shall be dimensioned relative to the station centerline. The electrical ladder logic drawings shall illustrate motor branch and liquid level control circuits to extent necessary to validate function and integration of circuits to form a complete working system.

C. Operations and Maintenance Manuals

1. Operation shall be in accordance with written instructions provided by the pump station manufacturer. Comprehensive instructions supplied at time of shipment shall

enable personnel to properly operate and maintain all equipment supplied. Content and instructions shall assume operating personnel are familiar with pumps, motors, piping and valves, but lack experience on exact equipment supplied.

2. Documentation shall be specific to the pump station supplied and collated in functional sections. Each section shall combine to form a complete system manual covering all aspects of equipment supplied by the station manufacturer. Support data for any equipment supplied by others, even if mounted or included in overall station design, shall be provided by those supplying the equipment. Instructions shall include the following as a minimum:
  - a. Functional description of each major component, complete with operating instructions.
  - b. Instructions for operating pumps and pump controls in all modes of operation.
  - c. Calibration and adjustment of equipment for initial start-up, replacement of level control components, or as required for routine maintenance.
  - d. Support data for commercially available components not produced by the station manufacturer, but supplied in accordance with the specifications, shall be supported by literature from the prime manufacturer and incorporated as appendices.
  - e. Electrical schematic diagram of the pump station circuits shall be in accordance with NFPA 70. Schematics shall illustrate, to the extent of authorized repair, pump motor branch, control and alarm system circuits including interconnections. Wire numbers and legend symbols shall be shown. Schematic diagrams for individual components, not normally repairable by the station operator, need not be included. Details for such parts shall not be substituted for an overall system schematic. Partial schematics, block diagrams, and simplified schematics shall not be provided in lieu of an overall system diagram.
  - f. Mechanical layout drawing of the pump station and components, prepared in accordance with good commercial practice, shall provide installation dimensions and location of all pumps, motors, valves and piping.
3. Operation and maintenance instructions which rely on vendor cut-sheets and literature which include general configurations, or require operating personnel to selectively read portions of the manual shall not be acceptable. Operation and maintenance instructions must be specific to equipment supplied in accordance with these specifications.

## 1.05 QUALITY ASSURANCE

### A. Manufacturer's Qualifications

1. The pumps and pump station manufacturer must be ISO 9001:2008 revision certified, with scope of registration including design control and service after sales activities.
2. The pumps and pump station manufacturer must be registered to the ISO 14001 Environmental Management System standard and as such is committed to

minimizing the impact of its activities on the environment and promoting environmental sustainability by the use of best management practices, technological advances, promoting environmental awareness and continual improvement.

3. Upon request from the engineer, the pump station manufacturer shall prove financial stability and ability to produce the station within the specified delivery schedules. Evidence of facilities, equipment and expertise shall demonstrate the manufacturer's commitment to long term customer service and product support.
4. Manufacturer must show proof of original product design and testing. Products violating intellectual property regulations shall not be allowed, as they may violate international law and expose the user or engineer to unintended liabilities. "Reverse-engineered" products fabricated to substantially duplicate the design of original product shall not be allowed, as they may contain substantial differences in tolerances and material applications addressed in the original design, which may contribute to product failure.
5. The term "pump manufacturer" or "pump station manufacturer" shall be defined as the entity which designs, machines, assembles, hydraulically tests and warrants the final product. Any entity that does not meet this definition will not be considered a "pump manufacturer" or "pump station manufacturer" and is not an acceptable supplier. For quality control reasons and future pump and parts availability, all major castings of the pump shall be sourced and machined in North America.

## B. Pump Performance Certifications

### 1. Solids Handling Capability

- a. All internal passages, impeller vanes, and recirculation ports shall pass a 2.5" spherical solid. Smaller internal passages that create a maintenance nuisance or interfere with priming and pump performance shall not be permitted. Upon request from the engineer, manufacturer's certified drawings showing size and location of the recirculation port(s) shall be submitted for approval.

### 2. Reprime Performance

- a. Consideration shall be given to the sanitary sewage service anticipated, in which debris is expected to lodge between the suction check valve and its seat, resulting in the loss of the pump suction leg, and siphoning of liquid from the pump casing to the approximate center line of the impeller. Such occurrence shall be considered normal, and the pump must be capable of automatic, unattended operation with an air release line installed.
- b. During unattended operation, the pump shall retain adequate liquid in the casing to insure automatic repriming while operating at its rated speed in a completely open system. The need for a suction check valve or external priming device shall not be required.
- c. Pump must reprime \_\_\_ vertical feet at the specified speed and impeller diameter. Reprime lift is defined as the static height of the pump suction above the liquid, while operating with only one-half of the liquid remaining in the pump casing. The pump must reprime and deliver full capacity within five minutes after

the pump is energized in the reprime condition. Reprime performance must be confirmed with the following test set-up:

- 1) A check valve to be installed down stream from the pump discharge flange. The check valve size shall be equal (or greater than) the pump discharge diameter.
  - 2) A length of air release pipe shall be installed between pump and the discharge check valve. This line shall be open to atmosphere at all times duplicating the air displacement rate anticipated at a typical pump station fitted with an air release valve.
  - 3) The pump suction check valve shall be removed. No restrictions in the pump or suction piping will prevent the siphon drop of the suction leg. Suction pipe configuration for reprime test shall incorporate a 2 feet minimum horizontal run, a 90 degree elbow and vertical run at the specified lift. Pipe size shall be equal to the pump suction diameter.
  - 4) Impeller clearances shall be set as recommended in the pump service manual.
  - 5) Repeatability of performance shall be demonstrated by testing five consecutive reprime cycles. Full pump capacity (flow) shall be achieved within five minutes during each cycle.
  - 6) Liquid to be used for reprime test shall be water.
3. Upon request from the engineer, certified reprime performance test results, prepared by the manufacturer, and certified by a registered professional engineer, shall be prepared and forwarded to the customer.

#### C. Manufacturer's Start-up Services

1. The manufacturer's technical representative shall inspect the completed installation, correct or supervise the correction of any defect or malfunction, and instruct operating personnel in the proper operation and maintenance of the equipment as described in Part 3 of this section.

#### 1.06 MANUFACTURER'S WARRANTY

- A. The pump station manufacturer shall warrant all equipment to be of quality construction, free of defects in material and workmanship. A written warranty shall include specific details described below.
  1. In addition to defects in material and workmanship, fiberglass reinforced polyester station enclosures are warranted for sixty (60) months to be resistant to rust, corrosion, corrosive soils, effects of airborne contamination or physical failures occurring in normal service for the period of the pump station warranty.

2. All other equipment, apparatus, and parts furnished shall be warranted for sixty (60) months, excepting only those items that are normally consumed in service, such as light bulbs, oils, grease, packing, gaskets, O-rings, etc. The pump station manufacturer shall be solely responsible for warranty of the station and all components.
  - B. Components failing to perform as specified by the engineer, or as represented by the manufacturer, or as proven defective in service during the warranty period, shall be replaced, repaired, or satisfactorily modified by the manufacturer.
  - C. It is not intended that the station manufacturer assume liability for consequential damages or contingent liabilities arising from failure of any vendor supplied product or part which fails to properly operate, however caused. Consequential damages resulting from defects in design, or delays in delivery are also beyond the manufacturer's scope of liability.
  - D. Equipment supplied by others and incorporated into a pump station or enclosure is not covered by this limited warranty. Any warranty applicable to equipment selected or supplied by others will be limited solely to the warranty, if any, provided by the manufacturer of the equipment.
  - E. This limited warranty shall be valid only when installation is made and use and maintenance is performed in accordance with manufacturer recommendations. A start-up report completed by an authorized manufacturer's representative must be received by manufacturer within thirty (30) days of the initial date the unit is placed into service. The warranty shall become effective on the date of acceptance by the purchaser or the purchaser's authorized agent, or sixty (60) days after installation, or ninety (90) days after shipment from the factory, whichever occurs first.

## **PART 2 – PRODUCT**

### **2.01 UNITARY RESPONSIBILITY**

- A. In order to unify responsibility for proper operation of the complete pumping station, it is the intent of these Specifications that all system components be furnished by a single supplier (unitary source). The pumping station must be of standard catalog design, totally warranted by the manufacturer. Under no circumstances will a system consisting of parts compiled and assembled by a manufacturer's representative or distributor be accepted.

### **2.02 MANUFACTURER**

- A. The pump station system integrator must be ISO 9001:2000 revision certified, with scope of registration including design control and service after sales activities.
- B. The specifications and project drawings depict equipment and materials manufactured by The Gorman-Rupp Company which are deemed most suitable for the service anticipated. It is not intended, however, to eliminate other products of equal quality and performance. The contractor shall prepare his bid based on the specified equipment for purposes of determining low bid. Award of a contract shall constitute an obligation to furnish the specified equipment and materials.

- C. After execution of the contract, the contractor may offer substitutions to the specified equipment for consideration. The equipment proposed for substitution must be superior in construction and performance to that specified in the contract, and the higher quality must be demonstrated by a list of current users of the proposed equipment in similar installations.
- D. In event the contractor obtains engineer's approval for equipment substitution, the contractor shall, at his own expense, make all resulting changes to the enclosures, buildings, piping or electrical systems as required to accommodate the proposed equipment. Revised detail drawings illustrating the substituted equipment shall be submitted to the engineer prior to acceptance.
- E. It will be assumed that if the cost to the contractor is less for the proposed substitution, then the contract price shall be reduced by an amount equal to the savings.

### 2.03 STATION ENCLOSURE

- A. The station enclosure shall contain and protect all pumps, interior piping, valves and associated controls. Enclosure shall incorporate the following design and service features:
  - 1. Access panels must be supplied on all sides. Location and size shall permit access for routine maintenance functions such as pump and motor inspection, drive belt adjustment, and pump clean-out. Non-hinged panels shall be secured with stainless steel tamper-proof hardware.
  - 2. A continuous hinge and latch shall be installed on at least two access panels. The hinged panels shall allow easy access to the electrical controls for frequent adjustments and inspections. A two-point mechanical latch assembly shall secure the panel at top and bottom. Latch handle locks shall be match keyed, requiring only one key to open all access panels.
  - 3. A vent in one access panel shall allow free air flow for enclosure ventilation.
  - 4. The complete station enclosure, less base, must be completely removable after disengaging reusable hardware. After disassembly, no portion of the enclosure (except electrical service entrance) shall project above the base surface to interfere with maintenance or endanger personnel.
  - 5. Disassembly and removal of the enclosure shall require no more than two people working without assistance of lifting equipment.
- B. Station enclosure shall be manufactured of molded reinforced orthophthalic polyester resins with a minimum of 30% fiberglass, and a maximum of 70% resin. Resin fillers or extenders shall not be used.
  - 1. Chopped glass fibers of 1 1/4 inch average length shall be sprayed and rolled. Major design consideration shall be given to structural stability, corrosion resistance, and watertight integrity. The polyester laminates shall provide a balance of mechanical, chemical, and electrical properties to insure long life. They must be impervious to micro-organisms, mildew, mold, fungus, corrosive liquids, and gases which are expected to be present in the environment surrounding the wet well.

2. All interior surfaces of the housing shall be coated with a polyester resin-rich finish providing maintenance-free service, abrasion resistance, and protection from sewage, greases, oils, gasoline, and other common chemicals.
  3. Outside surfaces of the enclosure shall be coated with gel-coat pigmented resin to insure long maintenance-free life and UV protection. Color used shall de-emphasize the presence of dirt, grease, etc.
- C. Station base shall be constructed of pre-cast, reinforced concrete encapsulated in a fiberglass mold. The design shall resist deformation of the structure during shipping, lifting, or handling. Base shall incorporate drainage provisions, and an opening sized to permit installation of piping and service connections to the wet well. After installation, the opening shall serve as a grout dam to be utilized by the contractor. The base shall incorporate anchor bolt recesses for securing the complete station to a concrete pad (supplied by the contractor) in accordance with the project plans.
- D. A blower mounted in the station roof shall be sized to exchange station air volume at least once every two minutes. Blower motor shall energize automatically at approximately 70 degrees F, and turn off at 55 degrees F. The blower motor control circuit shall incorporate a thermal-magnetic circuit breaker providing overcurrent and overload protection. Exhaust and inlet locations shall prevent the entrance of rain, snow, or debris.
- E. Tall Enclosure with Split Doors
1. The station shall be equipped with a 91 inch tall fiberglass enclosure. The control panel side and suction side of the fiberglass enclosure shall have split doors with the upper section of the doors raised vertically and the lower section of the doors opening horizontally outward. The upward portion of the split doors shall have additional equipment installed to prevent premature closing of the door. The pump station shall be furnished with 1" thick spray foam insulation, which shall be applied to the roof, doors, and corner panels.
- F. Station Heater
1. Pump station shall be provided with a 1300/1500 watt, 115 volt electric heater with cord and grounding plug. Ungrounded heaters shall not be acceptable.
- G. Insulation Package
1. The pump station shall be furnished with 1" thick spray foam insulation, which shall be applied to the roof, doors, and corner panels.

## 2.04 PUMP DESIGN

- A. Pumps shall be horizontal, self-priming centrifugal type, designed specifically for handling raw, unscreened, domestic sanitary sewage. Pump solids handling capability and performance criteria shall be in accordance with requirements listed under PART 1 - GENERAL of this section.
- B. The pump manufacturer must be ISO 9001:2000 revision certified, with scope of registration including design control and service after sales activities.
- C. Materials and Construction Features
  - 1. Pump casing: Casing shall be cast iron Class 30 with integral volute scroll. Casing shall incorporate following features:
    - a. Mounting feet sized to prevent tipping or binding when pump is completely disassembled for maintenance.
    - b. Fill port coverplate, 3 1/2" diameter, shall be opened after loosening a hand nut/clamp bar assembly. In consideration for safety, hand nut threads must provide slow release of pressure, and the clamp bar shall be retained by detente lugs. A Teflon gasket shall prevent adhesion of the fill port cover to the casing.
    - c. Casing drain plug shall be at least 1 1/4" NPT to insure complete and rapid draining.
    - d. Liquid volume and recirculation port design shall be consistent with performance criteria listed under PART 1 - GENERAL of this section.
  - 2. Coverplate: Coverplate shall be cast iron Class 30. Design must incorporate following maintenance features:
    - a. Retained by hand nuts for complete access to pump interior. Coverplate removal must provide ample clearance for removal of stoppages, and allow service to the impeller, seal, wearplate or check valve without removing suction or discharge piping.
    - b. A replaceable wearplate secured to the coverplate by weld studs and nuts shall be AISI 1015 HRS.
    - c. In consideration for safety, a pressure relief valve shall be supplied in the coverplate. Relief valve shall open at 75-200 PSI.
    - d. Two O-rings of Buna-N material shall seal coverplate to pump casing.
    - e. Pusher bolt capability to assist in removal of coverplate. Pusher bolt threaded holes shall be sized to accept same retaining capscrews as used in rotating assembly.
    - f. Easy-grip handle shall be mounted to face of coverplate.
  - 3. Rotating Assembly: A rotating assembly, which includes impeller, shaft, mechanical shaft seal, lip seals, bearings, sealplate and bearing housing, must

be removable as a single unit without disturbing the pump casing or piping. Design shall incorporate the following features:

- a. Sealplate and bearing housing shall be cast iron Class 30. Separate oil filled cavities, vented to atmosphere, shall be provided for shaft seal and bearings. Cavities must be cooled by the liquid pumped. Three lip seals will prevent leakage of oil.
    - 1) The bearing cavity shall have an oil level sight gauge and fill plug check valve. The clear sight gauge shall provide easy monitoring of the bearing cavity oil level and condition of oil without removal of the fill plug check valve. The check valve shall vent the cavity but prevent introduction of moist air to the bearings.
    - 2) The seal cavity shall have an oil level sight gauge and fill/vent plug. The clear sight gauge shall provide easy monitoring of the seal cavity oil level and condition of oil without removal of the fill/vent plug.
    - 3) Double lip seal shall provide an atmospheric path providing positive protection of bearings, with capability for external drainage monitoring.
  - b. Impeller shall be ductile iron, two-vane, semi-open, non-clog, with integral pump out vanes on the back shroud. Impeller shall thread onto the pump shaft and be secured with a lockscrew and conical washer.
  - c. Shaft shall be AISI 4140 alloy steel unless otherwise specified by the engineer, in which case AISI 17-4 pH stainless steel shall be supplied.
  - d. Bearings shall be anti-friction ball type of proper size and design to withstand all radial and thrust loads expected during normal operation. Bearings shall be oil lubricated from a dedicated reservoir. Pump designs which use the same oil to lubricate the bearings and shaft seal shall not be acceptable.
  - e. Shaft seal shall be oil lubricated mechanical type. The stationary and rotating seal faces shall be tungsten titanium carbide alloy. Each mating surface shall be lapped to within three light bands flatness (35 millionths of an inch), as measured by an optical flat under monochromatic light. The stationary seal seat shall be double floating by virtue of a dual O-ring design; an external O-ring secures the stationary seat to the sealplate, and an internal O-ring holds the faces in alignment during periods of mechanical or hydraulic shock (loads which cause shaft deflection, vibration, and axial/radial movement). Elastomers shall be viton. Cage and spring to be stainless steel. Seal shall be oil lubricated from a dedicated reservoir. The same oil shall not lubricate both shaft seal and shaft bearings. Seal shall be warranted in accordance with requirements listed under PART 1 - GENERAL of this section.
  - f. Pusher bolt capability to assist in removal of rotating assembly. Pusher bolt threaded holes shall be sized to accept same capscrews as used for retaining rotating assembly.
4. Adjustment of the impeller face clearance (distance between impeller and wearplate) shall be accomplished by external means.

- a. Clearances shall be maintained by a four point external shimless coverplate adjustment system, utilizing a four collar and four adjusting screw design allowing for incremental adjustment of clearances by hand as required. Each of the four points shall be lockable to prevent inadvertent clearance increases or decreases due to equipment vibration or accidental operator contact. The four point system also allows for equal clearance gaps at all points between the impeller and wear plate. Requirement of realignment of belts, couplings, etc., shall not be acceptable. Coverplate shall be capable of being removed without disturbing clearance settings. Clearance adjustment systems that utilize less than four points will not be considered.
  - b. There shall be provisions for additional clearance adjustment in the event that adjustment tolerances have been depleted from the coverplate side of the pump. The removal of stainless steel shims from the rotating assembly side of the pump shall allow for further adjustment as described above
  - c. Clearance adjustment which requires movement of the shaft only, thereby adversely affecting seal working length or impeller back clearance, shall not be acceptable.
5. Suction check valve shall be molded Neoprene with integral steel and nylon reinforcement. A blow-out center shall protect pump casing from hydraulic shock or excessive pressure. Removal or installation of the check valve must be accomplished through the coverplate opening, without disturbing the suction piping. Sole function of check valve shall be to save energy by eliminating need to reprime after each pumping cycle. Pumps requiring a suction check valve to assist reprime will not be acceptable.
  6. Spool flanges shall be one-piece cast iron, class 30 fitted to suction and/or discharge ports. Each spool shall have one 1-1/4" NPT and one 1/4" NPT tapped hole with pipe plugs for mounting gauges or other equipment.

#### D. Serviceability

1. The pump manufacturer shall demonstrate to the engineer's satisfaction that consideration has been given to reducing maintenance costs.
2. No special tools shall be required for replacement of any components within the pump.

#### E. Drain Kit

1. Pumps to be supplied with a drain kit for ease of maintenance. The kit shall contain 10' length of reinforced plastic hose with a female quick connect fitting at one end, and factory installed drain fittings in each pump. Fittings include a stainless steel pipe nipple, stainless steel bushing, stainless steel ball valve and aluminum male quick connect fitting.

#### F. Spare Parts Kit:

1. The following minimum spare parts shall be furnished with the pump station:
  - a. One pump mechanical seal
  - b. Required cover plate O-Ring(s)
  - c. One rotating assembly O-Ring(s)
  - d. One set of impeller clearance adjustment spacers

## 2.05 VALVES AND PIPING

- A. Check Valve: Each pump shall be equipped with a full flow type check valve capable of passing a 3" spherical solid. Valve shall be constructed with flanged ends and fitted with an external lever and torsional spring. Valve seat shall be constructed of stainless steel, secured to the body to ensure concentricity, sealed by an O-ring, and shall be replaceable. The valve body shall be cast iron incorporating a clean-out port large enough to allow removal and/or replacement of the valve clapper without removing valve or piping from the line. Valve clapper shall have a molded neoprene seating surface incorporating low pressure sealing rings. Valve hinge pin and internal hinge arm shall be stainless steel supported on each end in brass bushings. Shaft nut shall have double O-rings which shall be easily replaceable without requiring access to interior of valve body. All internal hardware shall be stainless steel. Valve shall be rated at 175 PSI water working pressure, 350 PSI hydrostatic test pressure. Valves other than full flow type or valves mounted in such a manner that prevents the passage of a 3" spherical solid shall not be acceptable.
- B. Plug Valve: A 3-way plug valve must allow either or both pumps to be isolated from the force main. The plug valve shall be non-lubricated, tapered type. Valve body shall be cast iron with flanged end connections drilled to 125 pound standard. The drip-tight shutoff plug shall be mounted in stainless steel bearings, and shall have a resilient facing bonded to the sealing surface. Valve shall be operated with a single lever actuator providing lift, turn, and reseal action. The lever shall have a locking device to hold the plug in the desired position.
- C. Automatic air release valves:
  1. An automatic air release valve shall be furnished for each pump designed to permit the escape of air to the atmosphere during initial priming or unattended repriming cycles. Upon completion of the priming cycle or repriming cycle, the valve shall close to prevent recirculation. Valves shall provide visual indication of valve closure, and shall operate solely on discharge pressure. Valves which require connection to the suction line shall not be acceptable.
  2. All valve parts exposed to sewage shall be constructed of cast iron, stainless steel, or similar corrosion resistant materials. Diaphragms, if used, shall be of fabric-reinforced neoprene or similar inert material.
  3. A cleanout port, three inches in diameter, shall be provided for ease of inspection, cleanout, and service.
  4. Valves shall be field adjustable for varying discharge heads.

5. Connection of the air release valves to the station piping shall include stainless steel fittings.

#### D. Gauge Kit

1. A gauge kit shall be supplied for each pump. Suction pressure must be monitored by a glycerin-filled compound gauge, and discharge pressure by a glycerin-filled pressure gauge. Gauges to be at least 4 inches in diameter, graduated in feet water column. Rated accuracy shall be 1% of full scale reading. Compound gauge shall be graduated -34 to +34 feet water column minimum. Pressure gauge to be graduated 0 to 140 feet water column minimum.
2. Gauges to be factory mounted on a resilient panel with frame assembly secured to pumps or piping. Gauge installations shall be complete with all hoses and stainless steel fittings, including a shutoff valve for each gauge line at the point of connection to suction and discharge pipes.

#### E. Piping

1. Flanged header pipe shall be centrifugally cast, ductile iron, complying with ANSI/AWWA A21.51/C115 and class 53 thickness.
2. Flanges shall be cast iron class 125 and Comply with ANSI B16.1.
3. Pipe and flanges shall be threaded and suitable thread sealant applied before assembling flange to pipe.
4. Bolt holes shall be in angular alignment within 1/2 degree between flanges. Flanges shall be faced with a gasket finish having concentric grooves a minimum of 0.01 inch deep by approximately 0.03 inch wide, with a minimum of three grooves on any given surface spaced a maximum of 1/4 inch apart.

- F. Supports and Thrust Blocks: Contractor must insure all pipes connected to the pump station are supported to prevent piping loads from being transmitted to pumps or station piping. Pump station discharge force main piping shall be anchored with thrust blocks where shown on the contract drawings.

#### G. Portable Pump Discharge Connection 4"

1. The station header pipe shall incorporate a 2-way plug valve to permit emergency access to the pump station force main after isolation of the pumps. Valve body shall be cast iron with flanged end connections drilled to 125 pound standard. The plug valve shall be non-lubricated type, furnished with a drip-tight shutoff plug mounted in stainless steel or Teflon over phenolic bearings, and shall have a resilient facing bonded to the sealing surface.
2. The bypass connection shall be accessible behind the hinged access panel on the wet well side of the station enclosure and shall terminate with a male OPW type quick connect fitting.

## 2.06 DRIVE UNIT

### A. Motors (Note: Maximum motor frame size is 326T open drip-proof.)

1. Pump motors shall be 15 HP, horizontal ODP, 1,800 RPM, NEMA design B with cast iron frame with copper windings, induction type, with class F insulation and 1.15 Service Factor for normal starting torque and low starting current characteristics, suitable for continuous service. The motors shall not overload at the design condition or at any head in the operating range as specified. Motors shall be suitable for operation using the utility power available specified in part 1 of this section.
2. Motors shall be tested in accordance with provisions of ANSI/IEEE Std. 112, Method B.

### B. Drive Transmission

1. Power to pumps transmitted V-belt drive assemblies. The sheave/belt combination shall provide the speed ratio needed to achieve the specified pump operating conditions.
2. Each drive assembly shall utilize at least two V-belts providing minimum a combined safety factor of 1.5. Single belt drives or systems with a safety factor of less than 1.5 are not acceptable. Computation of safety factors shall be based on performance data published by the drive manufacturer.
3. Precise alignment tolerances of the drive assemblies shall be achieved by means of a belt/sheave laser alignment system resulting in the reduction of vibration, accelerated wear, and premature failure.
4. The pump manufacturer shall submit power transmission calculations which document the following:
  - a. Ratio of pump/motor speed.
  - b. Pitch diameter of driver and driven sheaves.
  - c. Number of belts required per drive.
  - d. Theoretical horsepower transmitted per belt, based on vendor's data.
  - e. Center distance between pump and motor shafts.
  - f. Arc-length correction factor applied to theoretical horsepower transmitted.
  - g. Service factor applied to established design horsepower.
  - h. Safety factor ratio of power transmitted/brake horsepower required.
5. Pump drives to be enclosed on all sides by a guard constructed of fabricated steel or combination of materials including expanded, perforated, or solid sheet metal. No opening to a rotating member shall exceed 1/2 inch.
  - a. Guards must be completely removal without interference from any unit component, and shall be securely fastened and braced to the unit base.
  - b. Metal to be free from burrs and sharp edges. Structural joints shall be continuously welded. Rivet spacing on panels shall not exceed five inches. Tack welds shall not exceed four inch spacing.

- c. The guard shall be finished with one coat of gray W.R. non-lift primer and one coat of orange acrylic alkyd W.R. enamel in accordance with section 3, Color Definitions of ANSI 253.1; Safety Color Code for Marking Physical Hazards.

## 2.07 Finish

- A. Pumps, piping and exposed steel framework shall be cleaned prior to coating using an approved solvent wipe or phosphatizing cleaner. The part must thoroughly dry before paint application. Open joints shall be caulked with an approved polyurethane sealant. Exposed surfaces to be coated with two coats of a semi gloss white 2-component epoxy/polyamide to a dry film thickness of a minimum of 10 mils (5 mils minimum per coat). Coating shall be a high solids, 2 component epoxy/polyamide semi-gloss white coating for optimum illumination enhancement. The coating shall be corrosion, moisture, oil, and solvent resistant when completely dry. The factory finish shall allow for over-coating and touch-up for 6 months after coating. Thereafter, it will generally require sanding to accept a topcoat or touch-up coating. See Product Data Sheet for additional information.

## 2.08 ELECTRICAL CONTROL COMPONENTS

- A. The pump station control panel will be tested as an integral unit by the pump station manufacturer. The control panel shall also be tested with the pump station as a complete working system at the pump station manufacturer's facility.
- B. Panel Enclosure
  1. Electrical control equipment shall be mounted within a common NEMA 1 stainless steel, dead front type control enclosures. Doors shall be hinged and sealed with a neoprene gasket and equipped with captive closing hardware. Control components shall be mounted on removable steel back panels secured to enclosure with collar studs.
  2. All control devices and instruments shall be secured to the sub-plate with machine screws and lockwashers. Mounting holes shall be drilled and tapped; self-tapping screws shall not be used to mount and component. All control devices shall be clearly labeled to indicate function.
- C. UL Label Requirement
  1. Pump station controls shall conform to third party safety certification. The panel shall bear a serialized UL label listed for "Enclosed Industrial Control Panels". The enclosure, and all components mounted on the sub-panel or control cover shall conform to UL descriptions and procedures.
- D. Branch Components
  1. All motor branch and power circuit components shall be of highest industrial quality. The short circuit current rating of all power circuit devices shall be a tested combination or evaluated per the National Electrical Code Article 409. the lowest rated power circuit component shall be the overall control panel short circuit rating and shall not be less than the fault current available. The minimum control panel rating shall not be less than 10 kA, rms symmetrical. Control

assemblies operating at 120 volts nominal or less may be provided with transformers which limit the fault current and may be rated less than the minimum required short circuit rating.

2. Circuit Breakers and Operating Mechanisms

- a. A properly sized heavy duty circuit breaker shall be furnished for each pump motor. The circuit breakers must be sealed by the manufacturer after calibration to prevent tampering.
- b. An operating mechanism installed on each motor circuit breaker shall penetrate the control panel door. A padlockable operator handle shall be secured on the exterior surface. Interlocks must prevent opening the door until circuit breakers are in "OFF" position. An additional mechanism(s) shall be provided on the circuit breaker permitting the breaker to be operated and/or locked with the control panel door in the open position.

3. Motor Starters

- a. An open frame, across-the-line, NEMA rated magnetic starter with under-voltage release, and overload protection on all three phases, shall be furnished for each pump motor. Starters of NEMA size 1 and above shall allow addition of at least two auxiliary contacts. Starters rated "O", "OO", or fractional size are not acceptable. Power contacts to be double-break type made of cadmium oxide silver. Coils to be epoxy molded for protection from moisture and corrosive atmospheres. Contacts and coils shall be easily replaceable without removing the starter from its mounted position. Each starter shall have a metal mounting plate for durability.

4. Overload Relays

- a. Overload relays shall be solid-state block type, having visual trip indication with trip-free operation. Electrically resetting the overload will cause one (1) normally open and one (1) normally closed isolated alarm/control contact to reset, thus re-establishing a control circuit. Trip setting shall be governed by solid-state circuitry and adjustable current setting. Trip classes shall be 10, 15 and 20. Additional features to include phase loss protection, selectable jam/stall protection and selectable ground fault protection.
- b. A reset pushbutton, mounted through the control panel door, shall permit resetting the overload relays without opening the door.

5. Phase Monitor

- a. The control panel shall be equipped to monitor the incoming power and shut down the pump motors when required to protect the motor(s) from damage caused by phase reversal, phase loss, voltage unbalance, high voltage, and low voltage. An adjustable time delay shall be provided to minimize nuisance trips. The motor(s) shall automatically restart, following an adjustable time delay, when power conditions return to normal.

6. Transient Voltage Surge Suppressor

- a. The control panel shall be equipped with a modular surge arrester to minimize damage to the pump motors and control from transient voltage surges. The suppressor shall utilize thermally protected by heavy duty zinc-oxide varistors encapsulated in a non-conductive housing. Mechanical indicators shall be provided on each phase to indicate protection has been lost. The suppressor shall have a short circuit current rating of 200,000 Amps and a Maximum Discharge current rating [  $I_{max}$  ] of 40,000 Amperes. Nominal discharge current [  $I_n$  ] is 20,000 Amperes. Surge arrester according to UL 1449 3rd Edition, Type 2 component assembly.

E. Control Circuit

1. A normal duty thermal-magnetic circuit breaker shall protect all control circuits by interrupting control power.
2. Pump mode selector switches shall permit manual start or stop of each pump individually, or permit automatic operation under control of the liquid level control system. Manual operation shall override all shutdown systems, except the motor overload relays. Selector switches to be oil-tight design with contacts rated NEMA A300 minimum.
3. Pump alternation shall be integral to the liquid level controller. Provisions for automatic alternation or manual selection shall also be integral to the liquid level controller.
4. Six digit elapsed time meter shall be shall be displayed on the Integrinex™ Standard operator interface to indicate total running time of each pump in "hours" and "tenths of hours". Pump runtime shall be adjustable and password protected.
5. A high pump temperature protection circuit shall override the level control and shut down the pump motor(s) when required to protect the pump from excessive temperature. A thermostat shall be mounted on each pump casing and connected to the Integrinex™ Standard. If casing temperature rises to a level sufficient to cause damage, the thermostat causes the Integrinex™ Standard to interrupt power to the motor. The Integrinex™ Standard will display an alarm banner indicating the motor stopped due to high pump temperature. The motor shall remain locked out until the pump has cooled and circuit has been manually reset. Automatic reset of this circuit is not acceptable.
6. A duplex ground fault receptacle providing 115 VAC, 60 Hz, single phase current, will be mounted on the side of the control enclosure. Receptacle circuit shall be protected by a 15 ampere thermal-magnetic circuit breaker.
7. The lift station shall be equipped with a 3 KVA stepdown transformer to supply 115 volt, AC, single phase for the control and auxiliary equipment. The primary and secondary side of the transformer to be protected by a thermal magnetic circuit breaker, sized to meet the power requirements of the transformer. An operating mechanism shall penetrate the control panel door. and a padlockable operator

handle shall be secured on the exterior surface. Interlocks must prevent opening the door until circuit breakers are in "OFF" position. An additional mechanism(s) shall be provided on the circuit breaker permitting the breaker to be operated and/or locked with the control panel door in the open position.

8. Wiring

- a. The pump station, as furnished by the manufacturer, shall be completely wired, except for power feed lines to the branch circuit breakers and final connections to remote alarm devices.
- b. All wiring, workmanship, and schematic wiring diagrams shall comply with applicable standards and specifications of the National Electric Code (NEC).
- c. All user serviceable wiring shall be type MTW or THW, 600 volts, color coded as follows:
  - 1) Line and Load Circuits, AC or DC power.....Black
  - 2) AC Control Circuit Less Than Line Voltage.....Red
  - 3) DC Control Circuit.....Blue
  - 4) Interlock Control Circuit, from External Source.....Yellow
  - 5) Equipment Grounding Conductor.....Green
  - 6) Current Carrying Ground.....White
  - 7) Hot With Circuit Breaker Open.....Orange
- d. Control circuit wiring inside the panel, with exception of internal wiring of individual components, shall be 16 gauge minimum, type MTW or THW, 600 volts. Power wiring to be 14 gauge minimum. Motor branch wiring shall be 10 gauge minimum.
- e. Motor branch and other power conductors shall not be loaded above the temperature rating of the connected termination. Wires must be clearly numbered at each end in conformance with applicable standards. All wire connectors in the control panel shall be ring tongue type with nylon insulated shanks. All wires on the sub-plate shall be bundled and tied. All wires extending from components mounted on door shall terminate at a terminal block mounted on the back panel. All wiring outside the panel shall be routed through conduit.
- f. Control wires connected to door mounted components must be tied and bundled in accordance with good commercial practice. Bundles shall be made flexible at the hinged side of the enclosure. Adequate length and flex shall allow the door to swing full open without undue stress or abrasion. Bundles shall be held on each side of hinge by mechanical fastening devices.

9. Conduit

- a. Factory installed conduit shall conform to following requirements:
  - 1) All conduit and fittings to be UL listed.
  - 2) Liquid tight flexible metal conduit to be constructed of smooth, flexible galvanized steel core with smooth abrasion resistant, liquid tight polyvinyl chloride cover.

- 3) Conduit to be supported in accordance with articles 346, 347, and 350 of the National Electric Code.
- 4) Conduit shall be sized according to the National Electric Code.

10. Grounding

- a. Station manufacturer shall ground all electrical equipment inside the pump station to the control panel back plate. All paint must be removed from the grounding mounting surface before making final connection.
- b. The contractor shall provide an earth driven ground connection to the pump station at the main grounding lug in accordance with the National Electric Code (NEC).

11. Equipment Marking

- a. Permanent corrosion resistant name plate(s) shall be attached to the control and include following information:
  - 1) Equipment serial number
  - 2) Control panel short circuit rating
  - 3) Supply voltage, phase and frequency
  - 4) Current rating of the minimum main conductor
  - 5) Electrical wiring diagram number
  - 6) Motor horsepower and full load current
  - 7) Motor overload heater element
  - 8) Motor circuit breaker trip current rating
  - 9) Name and location of equipment manufacturer
- b. Control components shall be permanently marked using the same identification keys shown on the electrical diagram. Labels shall be mounted adjacent to device being identified.
- c. Switches, indicators, and instruments mounted through the control panel door shall be labeled to indicate function, position, etc. Labels shall be mounted adjacent to, or above the device.

2.09 LIQUID LEVEL CONTROL

- A. The manufacturer of the liquid level control system must be ISO 9001:2000 revision certified, with scope of registration including design control and service after sales activities.
- B. The level control system shall start and stop the pump motors in response to changes in wet well level, as set forth herein.
- C. The level control system shall be capable of operating as either an air bubbler type level control system, submersible transducer type system, or ultrasonic transmitter type system.
- D. The level control system shall utilize alternation to select first one pump, then the second pump, then the third pump (if required), to run as lead pump for a pumping cycle.

Alternation shall occur at the end of a pumping cycle, or in the event of excessive run time.

- E. The level control system shall utilize an electronic pressure switch which shall continuously monitor the wet well level, permitting the operator to read wet well level at any time. Upon operator selection of automatic operation, the electronic pressure switch shall start the motor for one pump when the liquid level in the wet well rises to the "lead pump start level". When the liquid is lowered to the "lead pump stop level", the electronic pressure switch shall stop this pump. These actions shall constitute one pumping cycle. Should the wet well level continue to rise, the electronic pressure switch shall start the second and/or third pump (if required) when the liquid reaches the "lag pump start level", or "standby pump start level" so that all pumps are operating. These levels shall be adjustable as described below.
1. The electronic pressure switch shall include integral components to perform all pressure sensing, signal conditioning, EMI and RFI suppression, DC power supply and 120 volt outputs. Comparators shall be solid state, and shall be integrated with other components to perform as described below.
  2. The electronic pressure switch shall be capable of operating on a supply voltage of 12-24Vdc in an ambient temperature range of -10 degrees C (14 degrees F) through 55 degrees C (131 degrees F). Ingress Protection of IP56 for indoor use with closed cell neoprene blend gasket material. Evaluated by Underwriters Laboratories for Pollution Degree 2 device for U.L. and cU.L. Control range shall be 0 to 33.3 feet of water with an overall repeat accuracy of (plus/minus) 0.1 feet of water. Memory shall be non-volatile. A Battery backed real time clock shall be standard.
  3. Eleven optically isolated, user defined digital inputs for pump and alarm status. Rated at 10mA at 24Vdc. Eight digital output relays (mechanical contacts), configurable for pump start/stop or alarms. Three relays rated at 12 Amp @ 28Vdc and 120Vac, five relays rated at 3 Amp @ 30Vdc and 120Vac. The electronic pressure switch shall consist of the following integral components: pressure sensor, display, electronic comparators, digital inputs and digital output relays.
    - a. The internal pressure sensor shall be a strain gauge transducer and shall receive an input pressure from the air bubbler system. The transducer shall convert the input to a proportional electrical signal for distribution to the display and electronic comparators. The transducer output shall be filtered to prevent control response to level pulsations or surges. The transducer range shall be 0-14.5 PSI, temperature compensated from -40 degrees C (-40 degrees F) through 85 degrees C (185 degrees F), with a repeat accuracy of (plus/minus) 2.5% full scale about a fixed temperature. Transducer overpressure rating shall be 3 times full scale.
    - b. The electronic pressure switch shall incorporate a digital back lighted LCD panel display which, upon operator selection, shall indicate liquid level in the wet well, and pump status indication for up to 3 pumps. The display shall include a 128 x 64 bit resolution LCD to read out directly in feet of water, accurate to within one-tenth foot (0.1 foot), with a full scale indication of not less than 12 feet. The display shall be easily convertible to indicate English or metric units.
    - c. Level adjustments shall be electronic comparator set-points to control the levels at which the lead, lag and standby pumps start and stop. Each of the level

settings shall be easily adjustable with the use of membrane type switches, and accessible to the operator without opening any cover panel on the electronic pressure switch. Controls shall be provided to permit the operator to read the selected levels on the display. Such adjustments shall not require hard wiring, the use of electronic test equipment, artificial level simulation or introduction of pressure to the electronic pressure switch.

- d. Each digital input can be programmed as pump run, pump HOA, pump high temp, pump moisture/thermal, starter failure (FVNR, RVSS, VFD), and phase failure. Inputs are used for status and alarm indication.
  - e. Each output relay in the electronic pressure switch shall be hard contact mechanical style. Each relay input shall be optically isolated from its output and shall incorporate zero crossover switching to provide high immunity to electrical noise. Each output relay shall have an inductive load rating equivalent to one NEMA size 3 contactor. A pilot relay shall be incorporated for loads greater than a size 3 contactor.
4. The electronic pressure switch shall be equipped with alarm banners with time and date history for displaying alarm input notification. Alarm history will retain a 16 of the most recent alarm events.
  5. The electronic pressure switch shall be equipped with pump start/stop and alarm input delay(s) that have an adjustable delay set points.
  6. An Antiseptic function with a built in timer shall be incorporated in the electronic pressure switch to prevent the well from becoming septic.
  7. The electronic pressure switch shall be capable of jumping to next available pump if current pump is out of service due to pump failure or manual selection. Circuit design in which application of power to the lag pump motor starter is contingent upon completion of the lead pump circuit shall not be acceptable.
  8. The electronic pressure switch shall be equipped with a simulator system capable of performing system cycle testing functions.
  9. The electronic pressure switch shall be capable of calculating and displaying pump elapse run time. The elapse run time is resettable and adjustable.
  10. The electronic pressure switch shall have internal capability of providing automatic simplex, duplex, and triplex alternation, manual selection of pump sequence operation, and alternation in the event of 1-24 hours of excessive run time.
  11. The electronic pressure switch shall be equipped with a security access code to prevent accidental set-up changes and provide liquid level set-point lock-out. The supervisor access code is adjustable.
  12. The electronic pressure switch shall be equipped with one (1) 0-33 ft. W.C. input, one (1) scalable analog input of either 0-5Vdc, or 4-20mA, and one (1) scalable analog output of either 0-5Vdc, 0-10Vdc or 4-20mA. Output is powered by 10-24Vdc supply. Load resistance for 4-20mA output shall be 100-1000 ohms.

13. The electronic pressure switch shall include a DC power supply to convert 120Vac control power to 12 or 24Vdc power. The power supply shall be 500 mA (6W) minimum and be UL listed Class II power limited power supply.
14. The electronic pressure switch shall be equipped with an electronic comparator and mechanical output relay to alert maintenance personnel to a high liquid level in the wet well. An alarm banner, visible on the front of the controller, shall indicate that a high wet well level exists. The alarm signal shall be maintained until the wet well level has been lowered and the circuit has been manually reset. High water alarm shall be furnished with a dry contact wired to terminal blocks.
15. The electronic pressure switch shall be equipped with an electronic comparator and mechanical output relay to alert maintenance personnel to a low liquid level in the wet well. An alarm banner, visible on the front of the controller, shall indicate that a low wet well level exists. The alarm signal shall be maintained until the cause for the low wet well level has been corrected and the circuit has been manually reset. A low liquid level condition shall disable all pump motors. When the wet well rises above the low level point, all pump motors shall be automatically enabled. Low water alarm shall be furnished with a dry contact wired to terminal blocks.

## 2.10 LIQUID LEVEL CONTROL (Float Switch Type)

- G. The level control system shall start and stop pump motors in response to changes in wet well level. It shall be a mercury free float switch type with floats to be secured to a vertical pipe in the wet well. Rising and falling liquid level in the wet well causes switches within the floats to open and close, providing start and stop signals to the remainder of the level control system.
- H. The level control system shall start and stop the pumps in accordance to the wet well level. Upon operator selection of automatic operation, a float switch shall start one pump motor when water rises to the "lead pump start level". When the water is lowered to the "lead pump stop level", the system shall stop this pump. These actions shall constitute one pumping cycle. Should the water continue to rise, an additional float switch will start the second pump after reaching the "lag pump start level" so that both pumps operate together. Both pumps shall stop at the same "all pumps off level". Circuit design in which application of power to the lag pump motor starter is contingent upon completion of the lead pump circuit shall not be acceptable.
- I. The level control system shall work in conjunction with an alternator relay to select first one pump, then the second pump, to run as "Lead" pump. Alternation will occur at the end of each pumping cycle.
- J. Float switches shall be supplied for installation by the contractor. Each float shall contain a mercury free switch sealed in a polypropylene housing, with 30 feet of power cord, and polypropylene mounting hardware. A PVC or stainless steel mounting pipe shall be furnished by the contractor to secure the switches in the wet well.
- K. A junction box shall be supplied for installation in the wet well by the contractor. Junction box shall be NEMA 4X, non-corrosive type incorporating terminal blocks match-marked to terminals in the control panel.

- L. A separate float switch shall be used to alert maintenance personnel to a high water level in the wet well (Low level float switch is optional). Should the water level rise to the "high water alarm" level, the float switch shall energize a 115-volt AC circuit for an external alarm device. An indicator, visible from front of control panel, shall indicate high level condition exists. The alarm signal shall maintain until wet well level is lowered and alarm circuit manually reset.
- M. An alarm silence switch shall provide maintenance personnel a means to de-energize the external alarm device while corrective actions are under way. After silencing the alarm, manual reset of the alarm signal shall provide automatic reset of the alarm silence relay.

## **PART 3 - EXECUTION**

### **3.01 EXAMINATION**

- A. Contractor shall off-load equipment at installation site using equipment of sufficient size and design to prevent injury or damage. Station manufacturer shall provide written instruction for proper handling. Immediately after off-loading, contractor shall inspect complete pump station and appurtenances for shipping damage or missing parts. Any damage or discrepancy shall be noted in written claim with shipper prior to accepting delivery. Validate all station serial numbers and parts lists with shipping documentation. Notify the manufacturer's representative of any unacceptable conditions noted with shipper.

### **3.02 INSTALLATION**

- A. Install, level, align, and lubricate pump station as indicated on project drawings. Installation must be in accordance with written instructions supplied by the manufacturer at time of delivery.
- B. Suction pipe connections are vacuum tight. Fasteners at all pipe connections must be tight. Install pipe with supports and thrust blocks to prevent strain and vibration on pump station piping. Install and secure all service lines (level control, air release valve or pump drain lines) as required in wet well.
- C. Check motor and control data plates for compatibility to site voltage. Install and test the station ground prior to connecting line voltage to station control panel.
- D. Prior to applying electrical power to any motors or control equipment, check all wiring for tight connection. Verify that protective devices (fuses and circuit breakers) conform to project design documents. Manually operate circuit breakers and switches to ensure operation without binding. Open all circuit breakers and disconnects before connecting utility power. Verify line voltage, phase sequence and ground before actual start-up.
- E. After all anchor bolts, piping and control connections are installed, completely fill the grout dam in the pump station base with non-shrink grout.

### **3.03 FIELD QUALITY CONTROL**

#### A. Operational Test

1. Prior to acceptance by owner, an operational test of all pumps, drives, and control systems shall be conducted to determine if the installed equipment meets the purpose and intent of the specifications. Tests shall demonstrate that all equipment is electrically, mechanically, structurally, and otherwise acceptable; it is safe and in optimum working condition; and conforms to the specified operating characteristics.
2. After construction debris and foreign material has been removed from the wet well, contractor shall supply clear water volume adequate to operate station through several pumping cycles. Observe and record operation of pumps, suction and discharge gage readings, ampere draw, pump controls, and liquid level controls. Check calibration of all instrumentation equipment, test manual control devices, and automatic control systems. Be alert to any undue noise, vibration or other operational problems.

#### B. Manufacturer's Start-up Services

1. Coordinate station start-up with manufacturer's technical representative. The representative or factory service technician will inspect the completed installation. He will calibrate and adjust instrumentation, correct or supervise correction of defects or malfunctions, and instruct operating personnel in proper operation and maintenance procedures.

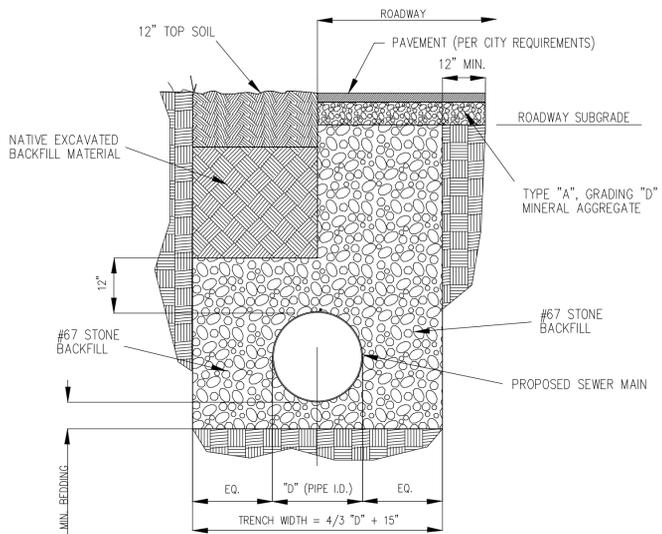
### 3.04 CLEANING

- A. Prior to acceptance, inspect interior and exterior of pump station for dirt, splashed material or damaged paint. Clean or repair accordingly. Remove from the job site all tools, surplus materials, scrap and debris.

### 3.05 PROTECTION

- A. The pump station should be placed into service immediately. If operation is delayed, drain water from pumps and piping. Open motor circuit breakers and protect station controls and interior equipment from cold and moisture. Station is to be stored and maintained per manufacturer's written instructions.

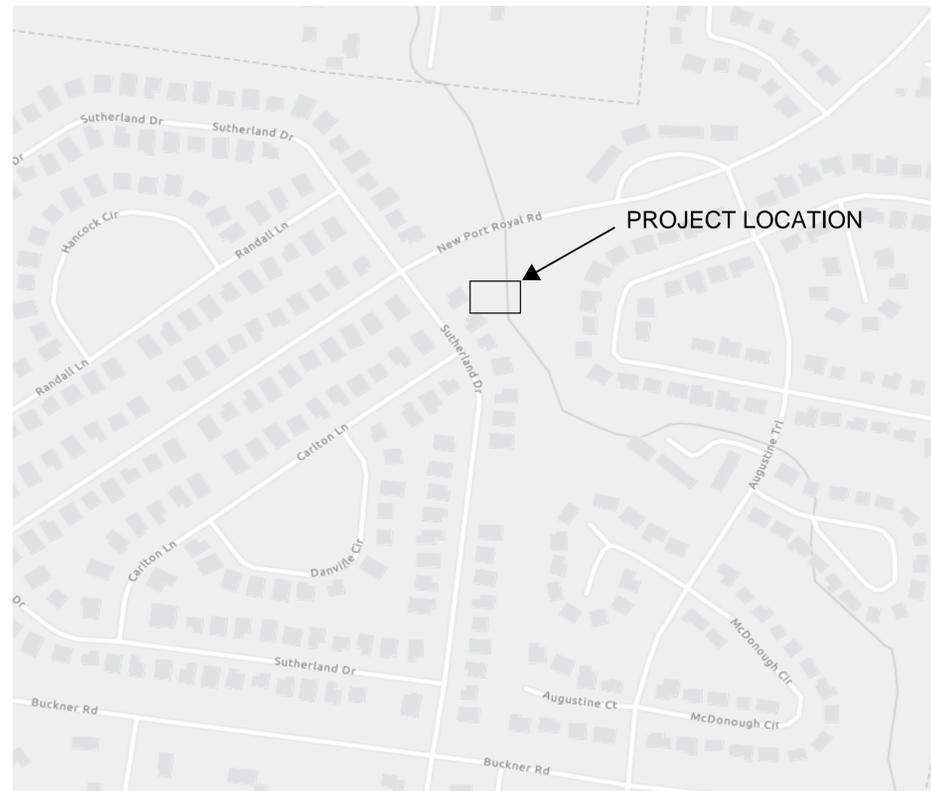
**END OF SECTION**



NOTES:  
 1. BACKFILL MATERIALS SHALL BE COMPACTED TO 98% STANDARD PROCTOR.  
 2. NATIVE EXCAVATED BACKFILL TO BE PLACED IN LIFTS NOT TO EXCEED 6" AND WITH ROCK, IF APPLICABLE, NO LARGER THAN 6 INCHES.

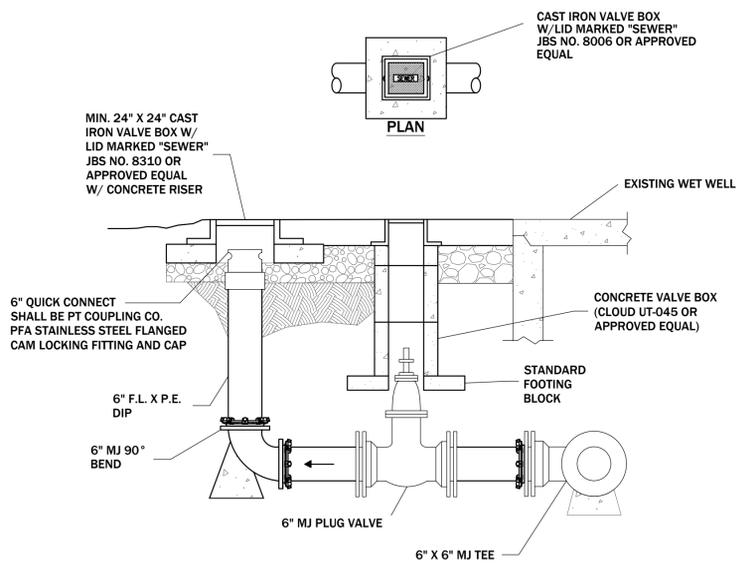
**SEWER LINE TRENCH AND BACKFILL DETAIL**

**BYPASS PUMPING NOTES:**  
 1. CONTRACTOR SHALL SUBMIT A BYPASS PUMPING PLAN FOR REVIEW AND APPROVAL BY THE CITY OF SPRING HILL PRIOR TO BYPASS PUMPING OPERATIONS.  
 2. CONTRACTOR SHALL PROVIDE A BYPASS PUMP TO PROVIDE THE CAPACITY OF THE EXISTING STATION. MINIMUM PUMPING CAPACITY = 180 GPM @ 70- FEET TDH. REDUNDANT PUMPING CAPACITY SHALL BE KEPT ON-SITE AT ALL TIMES.  
 3. BYPASS PUMPS SHALL BE CAPABLE OF PROVIDING REMOTE NOTIFICATION OF ALARMS OR TROUBLE CODES. ACCESS TO ALARMS AND CODES SHALL BE PROVIDED TO SPRING HILL PERSONNEL.



**SITE MAP**

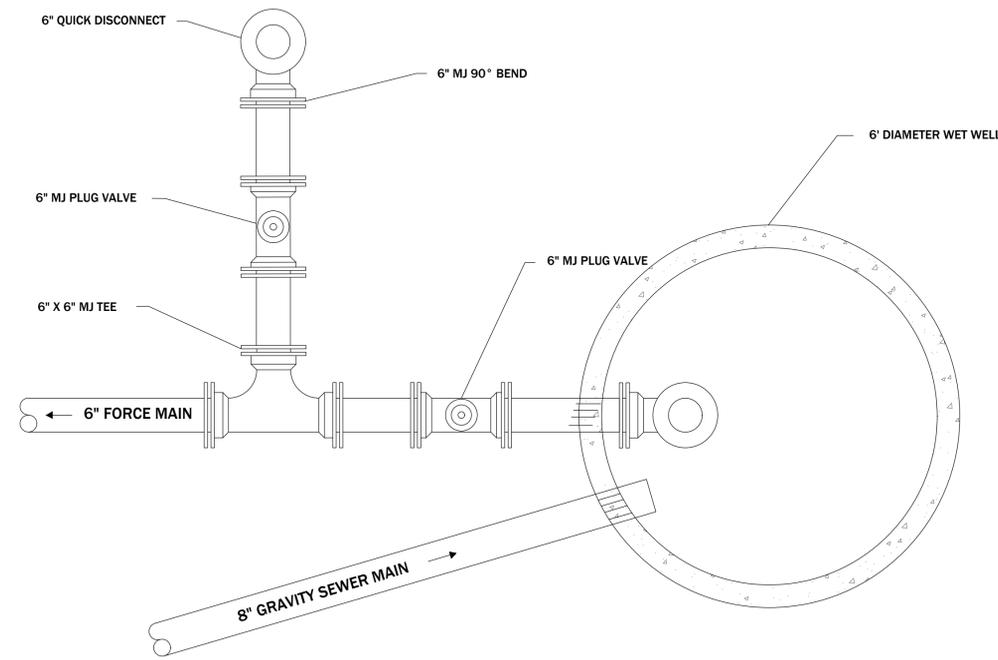
**SECTION**



NOTES: ALL JOINTS TO BE RESTRAINED

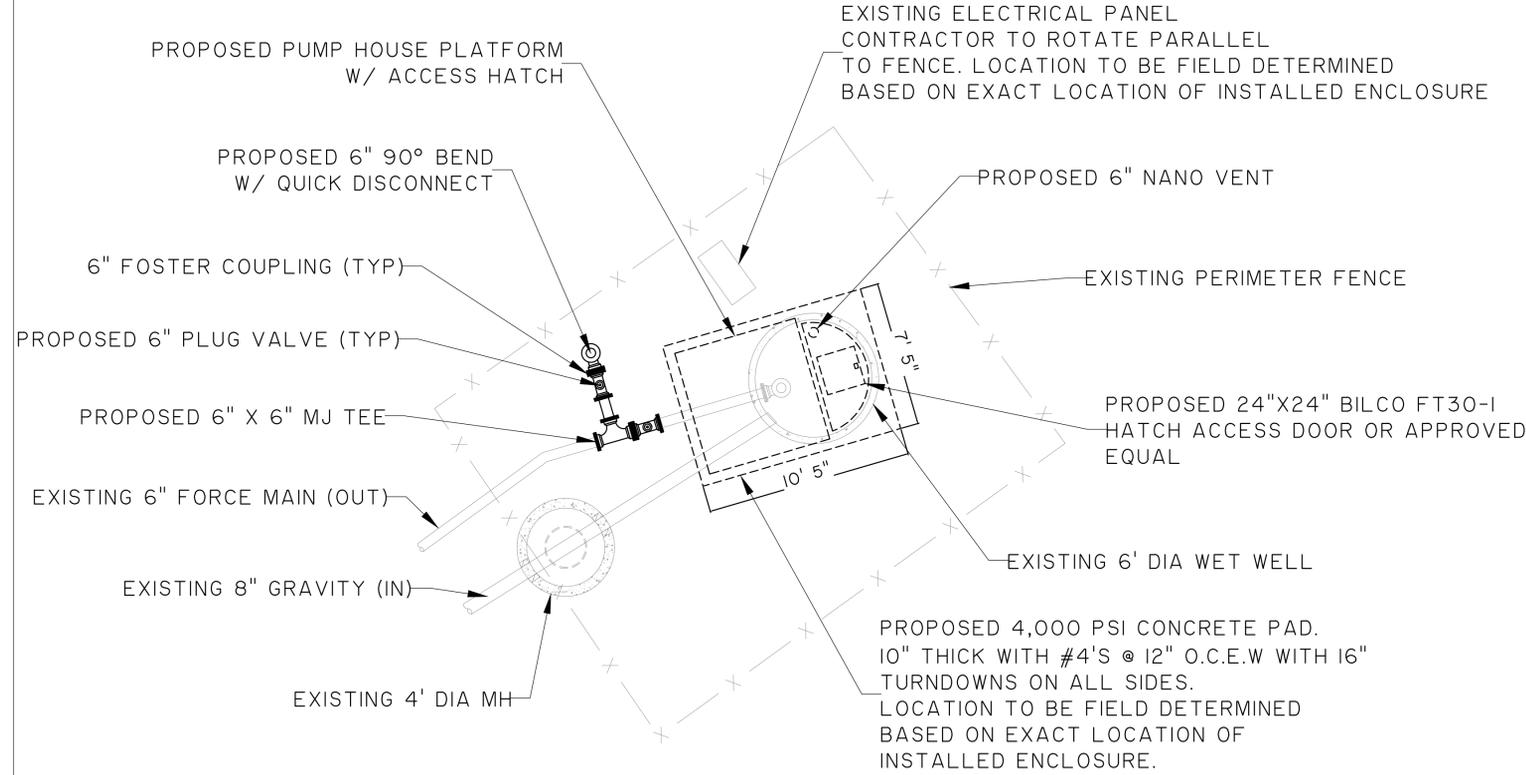
**FORCE MAIN BYPASS ASSEMBLY**

**PLAN**



NOTES: ALL JOINTS TO BE RESTRAINED

**FORCE MAIN BYPASS ASSEMBLY**



**PROPOSED FORCE MAIN BYPASS ASSEMBLY LAYOUT**

NOTE: CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS BASED ON THE MANUFACTURER FINAL DIMENSION PRIOR TO CONSTRUCTION OF CONCRETE PAD.

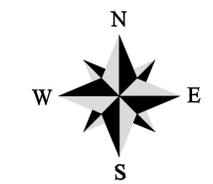


EXHIBIT  
**PICKETTS RIDGE**  
 SPRING HILL, TN  
 PREPARED FOR:  
 CITY OF SPRING HILL  
 PREPARED BY:  
**THOMAS & HUTTON**  
 502 Hazelwood Drive  
 Smyrna, TN 37167 • 615-220-5800  
 www.thomasandhutton.com

JOB NO: J-28298.0003	DATE: 12/12/2024
DRAWN: WHB	SCALE: NOT TO SCALE
REVIEWED: JRC	SHEET: