TMUA PROJECT NO. WPC 25-3,

FY '25 NORTHSLOPE CAPITAL EQUIPMENT REPLACEMENTS

ATTENDANCE AT PRE-BID CONFERENCE IS MANDATORY

PREPARED BY: Masaru Brook Iwata, P.E. CITY OF TULSA WATER AND SEWER DEPARTMENT 5628 N. 105TH East AVE., TULSA, OK 74117 918-591-4714 OFFICE, 918-218-4717 CELL MIWATA@CITYOFTULSA.ORG



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TECHNICAL SPECIFICATIONS

PROJECT SPECIFICATIONS

FOR

TULSA METROPOLITAN UTILITY AUTHORITY

PROJECT NO. WPC 25-3

FY'25 NORTHSLOPE CAPITAL EQUIPMENT REPLACEMENTS

TULSA, OKLAHOMA

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TECHNICAL SPECIFICATIONS

214 BID ITEM EQUIPMENT REPLACEMENT SPECIFICATIONS

Item No.	Spec. No.	General Description
1.	214.1	Grit Hopper Rehab - NSWWTP
2.	214.2	Grit Cyclone #2 & Valve Replacement - NSWWTP
3.	214.3	Digester Level Transmitter Replacement - NSWWTP
4.	214.4	Aeration Basin Butterfly Valve Actuator Replacement – NSWWTP
5.	214.5	Final Clarifier Scum Drive Actuator Replacement - NSWWTP
6.	214.98	Extra Work Allowance
7.	214.99	Mobilization Bid Item
		ADD ALTERNATIVES
Α.	214.6	Grit Cyclone #1 & Valve Replacement

200 INTRODUCTION

- 200.1 Project work shall include all equipment, labor, materials, hardware, cable, terminations, and incidentals necessary to remove existing equipment that is to be replaced, install the new equipment, and place the new equipment in fully operational, functional and warrantable service. All equipment to be supplied shall be brand new current year model and not used, remanufactured, or discontinued items.
- 200.2 Contractor shall field verify all elevations and dimensions of existing piping, valves, and equipment to be removed or demolished, and for replacement and/or modification. Contractor's work shall be based on field measurements and shall include field adjustments and additions for the proper installation of equipment. The contractor shall take note of all objects in the vicinity of equipment being installed to ensure that there are no issues with interference. It is the responsibility of the contractor to make modifications necessary to adjacent objects such as pipe supports and similar items to install the new equipment unless such objects are not reasonably visible during the site visit. It is the responsibility of the contractor to review all field conditions and take necessary field measurements prior to ordering equipment. The Authority will make available the information it has pertaining to the existing equipment.

200.3	The Authority's contact people are:

Northside Wastewater Treatment Plant	Masaru Brook Iwata P.E. – Sr. Engineer 5628 N 105 th East Avenue Tulsa, OK 74117 918-591-4714
Northside Wastewater Treatment Plant	Colin Wilmering – Plant Superintendent 5628 N 105 th East Avenue Tulsa, OK 74117 918-284-9005
Water Pollution Control	Cindy Cantero– Section Manager 175 E. 2 nd Street, Suite 1300 Tulsa, OK 74103 918-237-7401

201 QUALIFICATION REQUIREMENTS

- 201.1 Only contractors holding a valid pre-qualification certificate from the Tulsa Metropolitan Utility Authority in Classification A (General) or D (Utility Construction), are eligible to bid on this project. No additional qualification information is required to be submitted.
- 201.2 Only contractors that attend the mandatory pre-bid meeting will be allowed to bid on this project.

202 SUMMARY OF BID ITEMS

The Basis of Award shall be determined by the Total Base Bid plus additive alternates No. 1. Any proposal submitted incomplete shall be considered non-responsive

Bid Item No.	Specification No.	General Description
1	214.1	All materials, labor, equipment, and supervision required for rehab of all grit hopper assemblies in the Northside Wastewater Treatment Plant (NSWWTP) Headworks, per these specifications.
2	214.2	All materials, labor, equipment, and supervision required for removal and replacement of the grit cyclones #2, plug valves, & gauges at the Northside Wastewater Treatment Plant (NSWWTP), per these specifications.
3	214.3	All materials, labor, equipment, and supervision required for removal and replacement of the four (4) digester level transmitters at the Northside Wastewater Treatment Plant (NSWWTP), per these specifications
4	214.4	All materials, labor, equipment, and supervision required for removal and replacement of eight (8) butterfly valve actuator at the Northside Wastewater Treatment Plant (NSWWTP) Aeration Basin (AB1 through AB4), per these specifications.
5	214.5	All materials, labor, equipment, and supervision required for removal and replacement of four (4) Scum drive actuators at the Northside Wastewater Treatment Plant (NSWWTP) Final Clarifier Basin 1 through 4, per these specifications.
6	214.98	Extra Work Allowance – \$35,000.00 Lump Sum Allowance for various mechanical, electrical, plumbing, or unforeseen circumstances work not identified in the bid items.

7	214.99	Mobilization Bid Item – Not to exceed 5% of Base Bid Items not including the Mobilization Bid Item
ALT A	214.6	All materials, labor, equipment, and supervision required for removal and replacement of the grit cyclones #1, plug valves, & gauges at the Northside Wastewater Treatment Plant (NSWWTP), per these specifications.

203 <u>GENERAL CONTRACTOR RESPONSIBILITIES</u>

The cost of items in this Section and other Sections of these specifications shall be equitably included in Section 202 Bid items

- 203.1 Prior to disposal of any material or equipment that is City of Tulsa property and removed as part of the contract work, Contractor shall contact the Authority and explicitly offer to the Authority first right to claim and retain such materials or equipment as City of Tulsa property. Contractor shall be responsible for the disposal of all such equipment and materials not claimed by the Authority.
- 203.2 Contractor shall field verify all elevations and dimensions of existing piping, valves, and equipment to be demolished. Contractor work shall be based on field measurements and shall include field adjustments and additions for the proper installation of equipment. The contractor shall take note of all objects in the vicinity of equipment being installed to ensure that there are no issues with interference. It is the responsibility of the contractor to make modifications necessary to adjacent objects such as pipe supports and similar to install the new equipment unless such objects are not reasonably visible during the site visit. It is the responsibility of the contractor to review all field conditions and take necessary field measurements prior to ordering equipment. The Authority will make available the information it has pertaining to the existing equipment.
- 203.3 Contractor will coordinate, provide, and bear the cost of all items below:
 - Equipment, materials, tools.
 - Labor, supervision, coordination.
 - Procedures for continual operation of the wastewater facilities.
 - Flow stoppage, plugging, bypass pumping, sump pumping.
 - Rigging, lifting, material handling, illuminating.
 - Vacuum truck service and disposal of grit, sludge, sediment.
 - Trash service and disposal of debris.
 - Methods to prevent debris from going into drains.
 - Delivery, unloading, storage, and security of equipment and materials.
 - Protection of equipment and materials from damage.
 - Protection of water coils and water piping from freeze damage.
 - Procedures to prevent damage to underground pipes or utilities.
 - Paint, coatings, and other measures to protect new equipment and materials from corrosion.

- Electrical wires, cable, conduit, terminations, and other incidental items.
- Hardware, brackets, clamps, hangers, supports, equipment bases, and other incidental items.
- Modifications or replacement of concrete bases to accommodate the new equipment.
- Modifications to any previously-installed facility equipment and structures.
- Modifications or adaption needed to allow new equipment to properly fit with any previously-installed facility equipment and structures.
- Modifications due to new code requirements.
- Modifications due to new industry standards.
- Modifications due to lack of availability of certain equipment or materials.
- Fees, permits, inspections.
- 203.4 Before Starting Work for each Bid Item, Contractor will do all of the following:
 - Submit Documents for Review to the Engineer as per the Submittal Requirements.
 - Verify the Documents for Review have been checked and accepted by the Engineer as per paragraph GC-5 of the General Conditions of Contract.
 - Field-verify all necessary dimensions.
 - Field-verify the conditions of facility equipment and structures.
 - Verify that the capacity, performance, and dimensions of the new equipment will allow for proper operation of the Complete System.
 - Verify that clearances between any new equipment and any previouslyinstalled facility equipment and structures are reasonable, safe, and allow for proper operation of the Complete System.
 - Coordinate with the Engineer for approval of any modifications to facility equipment and structures.
 - Verify the availability of the equipment and materials the Contractor plans to use.
- 203.5 During and after installation of new equipment, Contractor will do all of the following:
 - Install new equipment per manufacturer's instructions
 - Verify the new equipment is installed correctly
 - Test the newly installed equipment under actual operating conditions
- 203.6 For purposes of draining of storage or conveyance structures, the contractor will do all of the following

- Coordinate with the Engineer. If conditions permit, the plant operations crew will attempt to drain the structure using installed facility equipment such as valves and built-in pumps. If conditions permit, the plant operations crew will attempt to provide general wash-down. The contractor will provide any needed pump or vaccum service to maintain drained condition.
- Provide any needed pumping or vaccum service if installed facility equipment is not functional or not fully functional.
- Provide any needed pumping or vaccum service to remove and dispose of grit, sediment, sludge, or bulk debris.

204 <u>SUBMITTALS</u>

All submittals shall be accompanied by a transmittal letter and/or cover letter that includes the project name and number, the contract specification number under which the equipment is being supplied, the Equipment ID number of the equipment being referenced, and the submittal revision number as appropriate.

- 204.1 Contractor shall submit, for each bid item, the manufacturer's instructions and recommendations for installation, for subsequent testing of the units, and for ensuring they are in proper operation. These instructions shall be part of these specifications and binding on the contractor.
- 204.2 Contractor shall include, for each bid item, a work plan acceptable to the Engineer describing the duration and sequence of work. Plan shall be approved prior to commencement of work. All work requiring flow stoppage or removing equipment from service must be scheduled at least 48 hours in advance with Plant Superintendent. When flow stoppage is required for equipment installation, contractor shall have all necessary materials at the installation site prior to any flow stoppage, and shall proceed with installation of equipment to minimize downtime.
- 204.3 Contractor shall, within 15 days of issuance of Work Order, submit three (3) copies of the following items for review and approval one (1) copy to be returned to Contractor following review, two (2) copies to be retained by Authority:
 - 204.3.1 Product Data and Information: Submit catalog data including rating and descriptive literature of all components and systems for approval by Authority. This shall include items required by 204.
 - 204.3.2 Itemized list with manufacturer's part numbers, part descriptions and schedule of values (unit prices) for the equipment proposed for each location.

- 204.3.3 Shop Drawings: Submit the following shop drawings for approval by Authority:
 - 204.3.3.1 Bill of materials including manufacturers' name and catalog number
 - 204.3.3.2 Outline drawing showing dimensions, arrangement, and Identification of components and nameplate schedule for all units
 - 204.3.3.3 Individual schematic control diagrams for each unit
- 204.3.4 Manufacturer's training, reports and certifications requirements:
 - Manufacturer's certification that the equipment is suitable and will perform within specification and manufacturer's design operating parameters for the locations and conditions herein specified. Manufacture's services shall also include site visits prior to construction, during installation and for start-up, as necessary for a detailed start up report and Manufacture's certification of proper installation. Submit Manufactures start-up reports and certification of proper installation when they become available and included copies in the final O&Ms. Start-up report should include pertinent start up details, equipment description, project information and complete initial set points and initial operational readings and date. Submit training agenda, handouts, power point/video and Speaker resume for acceptance prior to scheduling training. Provide two separate training days as coordinated with the Plant to accommodate both day and night shifts, to be a minimum of 4 hours minimum per training day (classroom and field training).
- 204.3.5 Safety Plan: This submittal will be checked for general conformance with Section 207 Safety requirements and applicable OSHA and local regulations. Notwithstanding, it is the Contractors responsibility to ensure that the plan is comprehensive and in full conformance with all applicable OSHA, federal, state and local regulations.
- 204.3.6 Work Plan (reference Section 204.2): Submit for approval by Authority, the work plan for each bid item clearly showing the work task sequencing plan and time requirements, including downtime durations. This shall include items required by Section 203.
- 204.3.7 Submit for approval by Authority, plans and specifications for any concrete pad, support, piping, or other construction modifications from original installation.

- 204.3.8 Warrantee Tracking Log: Shall be maintained by the contractor and shall be provided as a Monthly Meeting hand out and project completion end of project submittal
- 204.4 Operations and Maintenance Manuals:
 - 204.4.1 Contractor shall furnish to the Engineer two (2) hard copies of an Operation and Maintenance Manual for each piece of equipment and associated control systems furnished and installed.
 - 204.4.2 Contractor shall furnish to the Engineer one (1) soft copy of all O & M manuals. CDs/jump drives shall be formatted in pdf and shall contain all printed material included in the hard copies. A separate pdf folder shall be created for each **Equipment** numbered piece of equipment, within which all files pertaining to that piece of equipment shall be located.
 - 204.4.3 Prior to the work reaching 80 percent completion, Contractor shall submit to the Engineer for approval two (2) copies of the manual with all specified material. Submittal of the approval copies shall be made with the partial payment request for the specified completion. Within 30 days after the Engineer's approval of the two-copy submittal, Contractor shall furnish to the Engineer the remaining hard copies of the manual and the soft copy. Contractor shall submit any missing material for the manual prior to requesting certification of substantial completion.
 - 204.4.4 Format and Contents: Each O & M manual shall include the following:
 - 204.4.4.1 One copy of a completed **EQUIPMENT NAMEPLATE AND SUMMARY DATA** form.
 - 204.4.4.2 One copy of the equipment Start-Up report and Manufacture's certification of proper installation.
 - 204.4.4.3 One copy of the manufacturer's operating and maintenance instructions. Operating instructions include equipment start-up, normal operation, shutdown, emergency operation and troubleshooting. Maintenance instructions include equipment installation, calibration and adjustment, preventive and repair maintenance, troubleshooting, parts list and recommended spare parts.
 - 204.4.4.4 List of electrical relay settings and control and alarm

contact settings.

- 204.4.4.5 Electrical interconnection wiring diagram for equipment furnished including all control and lighting systems
- 204.4.6 Record drawings showing as-built schematic control diagrams for each unit and one-line diagrams.
- 204.4.4.7 Cross-references where required between the appropriate sections of the Contractor's O&M manual and the manufacturers' manuals.
- 204.5. Equipment Nameplate Information Contractor shall, upon startup of each piece of equipment, complete the form, titled EQUIPMENT NAMEPLATE AND SUMMARY DATA, found at the end of this section, and shall include the completed form in the front of that equipment's respective O & M manual. The form shall be included with each O & M manual copy submitted. Equipment ID nameplate requirements are found in the specification section of each bid item of these specifications.
- 204.6 Submittals shall be sent to the following address:

Masaru Brook Iwata, P.E. City of Tulsa Water and Sewer Department Northside Wastewater Treatment Plant 5628 N. 105th E. Ave., Tulsa, OK 74117 T: 918-591-4714, C: 918-218-4717 E: miwata@cityoftulsa.org

EQUIPMENT NAMEPLATE AND SUMMARY DATA

Equipment Number:	
Description (Include size):	
Project #:	
Spec. #:	
Vendor:	
Manufacturer:	
Model #:	··································
*Item or Drawing #	
"Serial #:	
Purchase Price. Date Placed in Service (for 1-vr Warrantv):	
Manufacturer's Warranty Period and End Date	
Parts / Associated Details:	
Maintenance Schedule	
(May be an attached sheet from O&M Manual; do not use "S	see O&M Manual")
• Iniual	
✓ Weekly:	
✓ Monthly:	
✓ Semi-Annual:	
✓ Annual:	
Applicable Motor Information: N.A.	(Circle if not applicable)

<u>Applicable meter internation</u>	
Vendor:	
Manufacturer:	
Model #:	
Item #:	
Serial #:	
Frame:	Insul. Class:
Volts/Hz/Amps:	
HP / RPM / SF:	
Manufacturer's Warranty Period and End Date:	
,	

***Item or Drawing #** may not be unique. For example, it may be the same for a group of same size valves or gates, each one having this same number that is unique to the group. The **Serial #** should be listed only when unique to this individual piece of equipment, otherwise it is N.A.

205 MONTHLY PROGRESS REPORTS AND PROGRESS MEETINGS

- 205.1 The Contractor shall submit monthly written project progress reports detailing the project's progress to date, problems encountered or anticipated which impact project schedule, and plans for the next two weeks' work.
- 205.2 Project progress reports shall be due as agreed upon during pre-work meeting.
- 205.3 Monthly progress meetings shall be scheduled on a weekday mutually agreeable to the Authority and the Contractor and shall be specified at the pre-work conference. The Contractor shall run the Monthly Meetings for the duration of the project and provide a meeting agenda including work completed, work planned, project, updated project schedule and other pertinent project status information.
- 205.4 The contractor shall submit a work progress and planned completion schedule for each bid item at the monthly progress meeting. The pre-work conference will constitute the first monthly progress meeting.
- 205.5 The Contractor shall maintain, update and submit an Equipment Log at each monthly meeting that lists each piece of equipment by Equipment ID number and lists Startup Date, Warranty Start Date and O&M Manual Submittal Date, among other project details. The spread sheet document shall be a shared document and submitted to the City at the end of the project for City's future use. A sample Equipment log is available upon request.

206 <u>SECURITY</u>

- 206.1 Each project site where work is to be performed under this Contract is a secured site. The Contractor shall be responsible for security as described in this section.
- 206.2 Site Access: The Contractor shall respect all existing security measures at each project site, and shall implement the following measures to apply to all work performed under this Contract. Coordination for Plant access and City of Tulsa security pass access will be required.

206.2.1 Work at both Northside and Southside shall be restricted to the hours defined by TMUA GC-19 unless otherwise authorized by the Plant Superintendent.

- 206.3 Common Requirements:
 - 206.3.1 Identification Badges: An Identification Badge, issued by the City of Tulsa Security Office, is required for the following people or any other person as directed by City of Tulsa Security, Plant Superintendent, or WPC Manager:
 - The driver of each vehicle that will be entering the facility multiple times or on a regular basis.
 - Sub-contractors and foremen that will be supervising other workers.

The Identification Badge also functions as an Access Card to allow access through the front gate of the facility. Six months is the maximum time that an Access Card is active.

- 206.3.2 Contractor will coordinate with the Engineer to request Identification Badges. Application for an Identification Badge will require a background investigation. Each person that is applying for an Identification Badge will need to complete the following two (2) forms:
 - City of Tulsa Access Card / Identification Card Request Form
 - City of Tulsa Security, Background and Prescreen Investigation Form
 - A current soft copy of the forms can be obtained from the Engineer.
- 206.3.3 The Contractor will send the completed forms as required. Approved individuals will coordinate with the City of Tulsa Security Office to complete the process and obtain their Identification Badge.
- 206.3.4 The Contractor will coordinate with the Engineer to request reactivation of Access Cards. Reactivation may require re-application and additional background investigation.
- 206.4 Contractor and Authority acknowledge that Contractor shall not solely be responsible for all secured access to the site, that City personnel will have access and will be performing their regular duties pertaining to the operation and maintenance of the site facilities, and that security at the site shall require the cooperation of all persons authorized to access the site for the performance of their work. To the extent the Contractor is responsible for and has control of secured access, Contractor shall restrict site access to only persons essential to the performance or inspection of the work being performed under this Contract.
- 206.5 Contractor shall provide Engineer twenty-four (24) hours advance notification of any delivery of equipment or materials to the site, and shall make arrangements with Engineer to provide for inspection of such delivery.
- 206.6 Any observation by the Contractor of activity at or associated with the project site that Contractor observes and considers to be unusual or suspicious in nature, or that poses a threat to the integrity or welfare of the project site or associated facilities, shall be duly noted at the time of the observation. Any such observation shall be immediately reported to the Engineer.
- 206.7 No statement pertaining to security in these Specifications shall constitute a contract between Contractor and Authority for the performance of security services.

- 207 <u>SAFETY</u>
 - 207.1 Contractor shall be responsible for performing all work under this contract in a safe manner and in compliance with all applicable local, state, and federal safety and health regulations. All of the following requirements shall apply:
 - 207.2 Contractor shall submit a site safety plan prior to start of work. Contractor's attention is directed to safety regulations applicable to the work under this contract, which include but are not limited to the following:
 - 207.2.1 OSHA Standards 29CFR1910.147, the control of hazardous energy (Lockout/Tagout)
 - 207.2.2 Fire Prevention and Protection: The Contractor shall take all necessary measures to prevent fire, and shall provide satisfactory firefighting means at the location of work.
 - 207.2.3 Condition of Equipment and Materials: All equipment, tools, and appliances, and materials used in connection with the project shall be handled and operated only when they are in safe operating condition and in accordance with a standard safety procedure.
 - 207.2.4 Confined Space Entry: Contractor shall determine if any work areas in this contract are considered permit spaces for entry, as defined in OSHA regulations, and shall perform all work so determined in accordance with all applicable state and federal labor, safety, and health regulations.
 - 207.2.5 Combustible Explosive Atmospheres: Contractor shall determine if any work areas in this contract are considered combustible and explosive spaces for entry, as defined in OSHA regulations, and shall perform all work and employ equipment in accordance with all applicable state and federal labor, safety, and health regulations.

208 PROTECTION OF PROPERTY

- 208.1 The protection of City, State and Government equipment, fences, gates, signs, and other City property is of prime importance, and if damaged, destroyed or removed, they shall be repaired, replaced, or paid for by the Contractor. Disturbance to this property must first be approved by the agency which controls it.
- 208.2 No valve or other control on any utility main or building service line shall be operated for any purpose by the Contractor.
- 208.3 At places where the Contractor's operations are adjacent to, or crossing, the plane of railway, telegraph, telephone, electric, and gas lines, or water lines, sanitary sewers, and storm sewers, damage to which might result in expense, loss or inconvenience,

work shall not be commenced until all arrangements necessary for the protection thereof have been made. Contractor shall notify the Notification Center of Oklahoma One-Call System, Inc., of any excavation or demolition prior to the commencement of such work. Notification shall be made no sooner than then (10) days nor later than forty-eight (48) hours prior to start of work, excluding Saturdays, Sundays, and legal holidays.

- 208.4 The Authority has attempted to locate all storm sewers, culverts, buried telephone or electrical conduits, sanitary sewers, water mains, and gas mains that might interfere with the construction of this project. The Contractor shall cooperate with the owners of any underground or overhead utility lines in their removal and rearrangement operations in order that these operations may progress in a reasonable manner and duplication or rearrangement work may be reduced to a minimum, and that services rendered by those parties will not be unnecessarily interrupted.
- 208.5 It shall be the responsibility of the contractor to follow all rules and regulations set forth by the Oklahoma Department of Environmental Quality with regards to storm water runoff associated with construction activities involving the disturbance of land. The contractor shall review the regulations and determine if a DEQ storm water discharge permit is required. If a permit is required, it is the responsibility of the contractor to apply for and obtain the permit prior to disturbance of soil. If a permit is not required, the contractor shall still take all necessary action to comply with DEQ rules.
- 208.6 In the event the contractor in any way fails to comply with the requirement of protecting, repairing, and restoring of any utility or utility service, the Engineer may, upon forty-eight (48) hours' notice, proceed to protect, repair, rebuild or otherwise restore such utility or utility service as may be deemed necessary, and the cost thereof will be deducted from any money due or which may become due the contractor pursuant to the terms of his contract.

209 PROTECTION OF MATERIALS

209.1 All materials and equipment delivered to the work site shall be adequately housed and protected against damage or deterioration as required by the equipment manufacturer. The Contractor shall keep his storage yard(s) in good order, arrange his materials neatly, and protect them from damage.

210 REFERENCES TO OTHER SPECIFICATIONS

210.1 Where a referenced American Society for Testing Materials (ASTM), National Electric Code (NEC), National Electrical Manufacturers Association (NEMA), American National

Standards Institute (ANSI), Institute of Electrical and Electronics Engineers (IEEE), or other agency designated specification is specified for a material, component, or device, that designated specification shall be the current revision, either tentative or adopted. If a referenced specification is in disagreement with these specifications, the Tulsa Metropolitan Utility Authority specifications shall govern.

211 <u>CLEAN-UP</u>

211.1 Immediately upon completion of the work at each site in the contract, the Contractor shall remove all excess materials, equipment, tools, and debris, and restore the site to a condition and in a manner satisfactory to the Engineer.

212 PLACING WORK IN SERVICE

- 212.1 If desired by the Authority, portions of the work may be returned to service when completed, and the Contractor shall give prior access to the work for this purpose, but such use and operation shall not constitute an acceptance of the work. Any such return to service shall comply with Section GC-38 of the General Conditions of these Contract Documents and Specifications.
- 212.2 <u>Warranty</u>: All equipment and work shall have a one (1) year factory warranty from date of acceptance, which shall include all materials and labor.

213 <u>PAYMENT</u>

- 213.1 Contractor will refer to Paragraph GC-29 of the General Conditions of Contract regarding partial payments. The Engineer will withhold the following percentage of the dollar amount for each Bid Item:
 - 5% for Documents for Record, Start-up Service (if required), Training Service (if required), and Final Acceptance of the Work including Equipment Identification Tags.
 - 5% retainage as required by Paragraph GC-29 of the General Conditions of Contract.

- 214.1 <u>All materials, labor, equipment, and supervision required for removal and replacement of</u> two (2) actuators & grit hopper rehab at the Northside Wastewater Treatment Plant (NSWWTP) Headworks Building, per these specifications.
 - 214.1.1 The project located at the City of Tulsa's Northside Wastewater Treatment, consists of removing and replacing the existing slide gate actuators with the proposed along with rehab of the slide gates. The project includes the correct and complete installation of new actuators, as specified herein. It also includes connection of new actuator to existing controls with existing cables where applicable. All work shall be performed in conformance with the manufacturer's instructions and recommendations for installation, subsequent testing of the new units, and ensuring they are in proper operation, including proper function with the NSWWTP's existing system.
 - 214.1.2 Existing actuator assembly to be replaced, its location and the proposed actuator assembly installation location are shown on the accompanying **WPC25-3** drawing sheets designated as **214.1A TO 214.1 B**.
 - 214.1.3 Contractor shall be knowledgeable about and shall field verify all elevations and dimensions of existing piping and equipment that in any way bears on the removal of the existing equipment and installation of the proposed equipment. Work shall be based on field measurements. The Authority will make available the information it has pertaining to the existing equipment.
 - 214.1.4 Project work shall include all materials, equipment, labor, and supervision, necessary to complete the project as specified herein, including but not limited to any and all crane work, rigging, delivery and complete installation of components to fully operational and warrantable condition.
 - 214.1.5 Contractor shall submit work plan acceptable to the Engineer describing the duration and sequence of work. Plan shall be approved prior to commencement of work. All work requiring flow stoppage or equipment removed from service must be scheduled 48 hours in advance with Plant Superintendent.
 - 214.1.5.1 All unneeded equipment and debris from any work shall become the responsibility of the contractor and shall be removed from the site and disposed of properly.
 - 214.1.6 Installation of new motor actuators, connection rod, NEMA 7 limit switches, limit switch mounting brackets and hardware. This item includes the installation of an electrical connection in accordance with Specification

Section 204.4.

214.1.6.1 The existing actuators were manufactured by Rotork IQ 25 NEMA 7 enclosure, ON/OFF control with 4 programable contacts 460V 3 Phase, bore to be verified at time of order, for the Northside Wastewater Treatment Plant. The new equipment shall be manufactured by Rotork or Limitorque.

214.1.6.2	Replacement parts f	for the slide gates:
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EQUIPMEN	EQUIPMENT AND PARTS	
Qty	Description	
2	Rotork IQ25, Electric actuator	
2	Threaded Mount Nut, RH, Bronze	
2	ACME Screw	
2	Flange, Steel	
2	Set UHMW Glides	

- 214.1.7 The actuator shall be installed to work with existing control systems, including the NSWWTP's existing system.
- 214.1.8 Contractor shall use caution to avoid damage to existing power and data cables. Existing power and data cables running from MCC and PLC to control boxes shall not be replaced unless damaged. Contractor shall be responsible for any damage to existing electrical equipment or power cables. Power and data cables between control boxes and actuator shall be new.
- 214.1.9 <u>TAGGING</u>: Contractor shall supply equipment tags. Tags shall show the City of Tulsa's Equipment ID number for each actuator (as listed below) The tags shall be visible without the need to "hunt" for the tags and shall be viewable and readable from eye level. <u>Equipment ID Plates</u>

All equipment tagged on the drawings, except for buried submerged equipment shall be provided with an Equipment ID Plate bearing the equipment tag number identified on the drawings. Equipment ID Plates shall be rectangular 3.5"x .75" and 1/16" thick laminated Blue/White, laminated impact acrylic such as Rowmark UltraMattes 322-512, or equivalent. Lettering shall be 1 line of text, centered, and white capitalized block letters .25" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment IDing scheme.

Equipment ID Plates shall be attached with permanent adhesive.



VALVE AND GATE EQUIPMENT ID PLATES

Equipment Equipment ID Plates

All valves and gates, except buried or submerged valves, that have been assigned an Equipment ID on the Drawings or in the valve or gate schedule, shall be provided with a permanent number plate. Equipment ID Plates shall be round 1.5" and 1/16" thick laminated blue phenolic plastic engraving stock that is U/V stable. Lettering shall be in 3 sections, centered, and white capitalized block letters 3/16" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment ID Scheme.

Equipment ID Plates shall be attached with permanent ties.



Equipment ID Tag Number:

N020-HDW1-HPR01

N020-HDW1-HPR02

214.1.10 <u>TESTING.</u> The actuators shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. After completion of the installation, the equipment shall be tested by the Contractor under actual operating conditions. An Authorized Manufacturer's Representative shall do onsite verification at Start-Up.

3.0 GENERAL

<u>Immediately</u> inspect the equipment for damage that may have occurred in transit to the jobsite. Within 48 hours, report this damage to JDV Equipment Corporation, Dover, NJ and to the transport carrier.

When lifting the equipment, sufficient lifting straps must be used. If a forklift truck is used, protective devices shall be put between the forks and the machine in order to prevent damage to the equipment. Care should be taken to avoid damage to stainless steel or painted surfaces.

The hopper is equipped with brackets for mounting the supports. Supports and fasteners are also included. When mounting the supports, consideration must be taken to assure proper alignment and position. Secure all fasteners in accordance with accepted practices in order to prevent vibrations. Floor mount supports may require grouting to assure proper location and elevation. Refer to weigh cells section 4 for information on installation. (Refer to equipment and support drawings manual.)

3.1 CHECKS AND PREPARATIONS

The following checks must be conducted prior to assembly:

- Check that the equipment has not been damaged in transit.
- Take care not to damage the equipment during unloading.
- ► If forklift trucks are used during unloading the equipment must be protected with padding material.
- Before the equipment is installed, its dimensions must be checked against the dimensions on the installation drawing.
- Place the equipment in its intended position.

3.2 - ASSEMBLY & INSTALLATION INSTRUCTIONS

<u>3.2.1</u> ASSEMBLY OF THE HOPPER CHUTES

- Lay out the sections in a straight line.
- Check that the sections are positioned in the right order. The ends are marked with letters to show the order in which they should be assembled. See the drawing for more information.
- Make sure that the sealing strip is placed between the sections, or use a quality silicone caulk between the sections.
- Screw the sections together with the screws, nuts and washers provided.



ASSEMBLY OF FLANGED SECTION

3.2 - ASSEMBLY & INSTALLATION INSTRUCTIONS - (CONT'D)

3.2.2 ASSEMBLY OF THE HOPPER AND CHUTES

Supports should be installed with the fasteners provided and at the location shown on the drawings. The floor supports are designed to be anchored and grouted to the floor of the existing building (anchorage and grout by others). The elevation and location of the chutes should be maintained as shown on the enclosed drawings.

Make sure that no one is standing beneath the equipment while it is being lifted or mounted.

- Lift the hopper so that is assumes its operating position. The hopper should be lifted where the stands are to be fixed.
- Fix the stand so that the legs are in place with bolts or welded if necessary.
- Degrease all the weld surfaces
- Fasten the support with bolts or with welds on both sides of the legs.
- Remove all support aids and anchor the support to the floor. Make sure that the hoppers are sufficiently anchored to withstand working load

3.3 - OPERATION INSTRUCTIONS

3.3.1 INITIAL START-UP & OPERATION

Before the initial start-up, all basic mechanical and electrical adjustments must be made. In all circumstances these adjustments must be made by skilled tradesmen.

Ball screw jacs are shipped with grease in the unit. However, before operating any unit remove the housing plug and check the condition of the lubricant. "Refer to Section 8 for further information"

The slide gate unit may now be started and run for a short period of time to determine that the direction of open and closed position is correct.

3.3.2 ROUTINE START-UP & OPERATION

Before the start-up, all basic mechanical and electrical adjustments must be made. In all circumstances these adjustments must be made by skilled tradesmen.

Under normal operation it is recommended that the hopper be inspected to make sure all safety devices are intact and operational prior to the addition of <u>any</u> material to the hopper. Prior to any start-up the inlet should be inspected to determine if there are any obstructions or material that will interfere with the operation of the JDV system.

DO NOT INSPECT, CLEAR THE INLET, OR REMOVE THE LIDS OF THE HOPPER WHILE IT IS IN OPERATION; SERIOUS INJURY MAY OCCUR

DO NOT ATTEMPT TO REMOVE CLOGS AT THE INLET OR DISCHARGE WHILE IN OPERATION. DO NOT REMOVE THE ACCESS COVERS WHILE OPERATING.

When removing debris from the inlet or discharge care should be taken to avoid damage to the transition chutes and the liner.

3.4 - LUBRICATION INSTRUCTIONS

3.4.1 LUBRICATION

3.4.2 EVERY MONTH

Check hopper for abnormal fatigue or weld failures. Make sure concrete around hopper does not have any cracks or signs of fatigue.

BALL SCREW JACS

Lubrication inspection is recommended at regular intervals. Usually one month intervals are satisfactory unless experience indicates that regreasing should occur at shorter or longer intervals.

3.5 - MAINTENANCE INSTRUCTIONS

3.5.1 MAINTENANCE

3.5.2 EVERY DAY

Check that inspection doors and other openings are closed or free of obstructions.

3.5.3 EVERY WEEK

Check that all safety equipment operates correctly, both mechanical and electrical.

3.5.4 EVERY MONTH

Clean the hopper inside and outside (if necessary).

Check the liner for wear (visual inspection).

Check the slide gate for damage (visual inspection).

Check the slide gate for wear.

Check the slide gate rollers.

3.5.5 EVERY SIX MONTHS

Check all bolts and welds. Check anchorage to concrete.

Check the electronic control system, i.e. emergency stop, sequential control, fuses sensors and pneumatics etc.

IF A DEFECT OR ABNORMAL WEAR OR CORROSION SHOULD OCCUR CORRECTIVE MEASURES MUST BE TAKE IMMEDIATELY.

3.6 SHUTDOWN INSTRUCTION PROCEDURES

3.7.1 <u>LONG TERM SHUTDOWN PROCEDURE:</u> (If conveyor will not be operated for more than seven (7) days).

*Following shutdown thoroughly wash down internal surfaces of hopper removing any accumulated solids or debris.

*Prior to a restart inspect the following items:

Wear liner Safety Equipment Regrease gate drive train – refer to lubrication section.

(Refer to General Maintenance Instruction of this Manual)

- 214.2 <u>All materials, labor, equipment, and supervision required for removal and replacement of</u> four (4) WEMCO grit cyclones & associated valves, piping, & attachments at the Northside Wastewater Treatment Plant (NSWWTP) Headworks Building, per these specifications.
 - 214.2.1 The project located at the City of Tulsa's Northside Wastewater Treatment, consists of removing and replacing the existing WEMCO grit cyclones with the proposed. The project includes the correct and complete installation of new cyclones, plug valves, pressure gauge, and piping as specified herein. All work shall be performed in conformance with the manufacturer's instructions and recommendations for installation, subsequent testing of the new units, and ensuring they are in proper operation, including proper function with the NSWWTP's existing system.
 - 214.2.2 Existing grit cyclone assembly to be replaced, its location and the proposed assembly installation location are shown on the accompanying **WPC25-3** drawing sheets designated as **214.2A & 214.2B**.
 - 214.2.3 Contractor shall be knowledgeable about and shall field verify all elevations and dimensions of existing piping and equipment that in any way bears on the removal of the existing equipment and installation of the proposed equipment. Work shall be based on field measurements. The Authority will make available the information it has pertaining to the existing equipment.
 - 214.2.4 Project work shall include all materials, equipment, labor, and supervision, necessary to complete the project as specified herein, including but not limited to any and all crane work, rigging, delivery and complete installation of components to fully operational and warrantable condition.
 - 214.2.5 Contractor shall submit work plan acceptable to the Engineer describing the duration and sequence of work. Plan shall be approved prior to commencement of work. All work requiring flow stoppage or equipment removed from service must be scheduled 48 hours in advance with Plant Superintendent.
 - 214.2.5.1 All unneeded equipment and debris from any work shall become the responsibility of the contractor and shall be removed from the site and disposed of properly.
 - 214.2.6 Installation of new cyclones, valves, and pressure gauging equipment.
 - 214.2.6.1 The existing cyclones are manufactured by WEMCO WEMCLONE 1000C 4" inlet, 6" outlet, 4" vortex finder. The new equipment shall be manufactured by WEMCO. Valves to

be dezuirk 12.00-1D eccentric plug valves or approved equal. Four (4) 22 degree ductile iron elbows, Four (4) 90 degree ductile elbows, new 0-60 PSIG 6" dial ashcroft pressure gauge or approved equal, 316L glycerin diaphragm seal, 316L 9" TBE schedule 40 nipple. 316L 1x ½" bushing, and new 316L hardware.

214.2.6.2 **General Rating:** Valve shall be of full lug or full flange flat face-to-face design. Valve will have threaded flange bolt holes to permit independent upstream or downstream pipe flange removal without affecting the shutoff or body shell pressure rating of the valve.

214.2.6.2 **Pressure Rating:**

214.1.6.2.1: Body shell pressure rating shall be 150 psig CWP.

214.1.6.2.2: Standard Shut off pressure rating shall be 150 psi.

214.1.6.2.3: The valve body shall be tested at 1.5 times the rated pressure and the valve gate at 1.1 times the rated pressure while in the fully shut position with zero cc/min leakage permitted past the seat or to valve exterior.

214.2.6.3 Materials:

214.1.6.3.1: shall be of cast iron per ASTM A126 Class B. Flanged end valves shall be of the AWWA C504 short body design with Class 125 flanged ends faced and drilled per ASME B16.1 standard for cast iron flanges. Mechanical Joint end valves shall meet the requirements of AWWA C111/ANSI 21.11.

214.2.6.3.2 shall meet or exceed the requirements of the latest revision of AWWA Standard C504 for Class 150B plug valves. Valves 4" and smaller shall have a working pressure of 200 psi (1380 kPa). When customer specified, valves shall meet NSF/ANSI 61/372.

214.2.6.3.3: shall be designed and tested per the requirements of AWWA C504. Handwheel AWWA nut input. All units shall have independently adjustable open and closed position stops that are adjustable under full line pressure and

flow. Open and closed position stop adjustments shall not require the removal of any load or torque transmitting components.

214.2.6.4 **Design:**

214.2.6.4.1: See attached 5600F-5700F spec sheet for additional information on the plug valves

- 214.2.6.5 **Valve Operators:** Valves identified in the drawings as manually operated shall be oriented so that the valve indicator is visible during operation of the valve. Valve wheel to match existing valves.
- 214.2.6.6 **Coatings:** All non stainless steel metal surfaces shall be prepped, blasted, chip resistant primed, and Painted to match the other grit line.
- 214.2.7 <u>INSTALLATION:</u> The valves shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. All fasteners shall be 316 stainless steel and a nickel based antiseize shall be applied to threaded fasteners during assembly. Contractor shall provide the piping necessary for any modifications to connect the proposed valves into the existing hard piping systems.
- 214.2.8 Contractor shall use caution to avoid damage to existing power and data cables. Contractor shall be responsible for any damage to existing electrical equipment or power cables. Power and data cables between control boxes and actuator shall be new.
- 214.2.9 <u>TAGGING</u>: Contractor shall supply equipment tags. Tags shall show the City of Tulsa's Equipment ID number for each grit cyclone (as listed below) The tags shall be visible without the need to "hunt" for the tags and shall be viewable and readable from eye level. <u>Equipment ID Plates</u>

All equipment tagged on the drawings, except for buried submerged equipment shall be provided with an Equipment ID Plate bearing the equipment tag number identified on the drawings. Equipment ID Plates shall be rectangular 3.5"x .75" and 1/16" thick laminated Blue/White, laminated impact acrylic such as Rowmark UltraMattes 322-512, or equivalent. Lettering shall be 1 line of text, centered, and white capitalized block letters .25" high and engraved to a depth of 0.08mm. Equipment ID Plates must follow the Equipment IDing scheme.

Equipment ID Plates shall be attached with permanent adhesive.

XXXX-XXXX-XXXXX

VALVE AND GATE EQUIPMENT ID PLATES

Equipment Equipment ID Plates

All valves and gates, except buried or submerged valves, that have been assigned an Equipment ID on the Drawings or in the valve or gate schedule, shall be provided with a permanent number plate. Equipment ID Plates shall be round 1.5" and 1/16" thick laminated blue phenolic plastic engraving stock that is U/V stable. Lettering shall be in 3 sections, centered, and white capitalized block letters 3/16" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment ID Scheme.

Equipment ID Plates shall be attached with permanent ties.



Equipment ID Tag Number:

N020-HDW1-CYC01

N020-HDW1-CYC02

N020-HDW1-CYC03

N020-HDW1-CYC04

214.2.10 <u>TESTING.</u> The grit cyclones shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. After completion of the installation, the equipment shall be tested by the Contractor under actual operating conditions. An Authorized Manufacturer's Representative shall do onsite verification at Start-Up.

- 214.3 <u>All materials, labor, equipment, and supervision required for removal and replacement of</u> four (4) differential pressure sensors at the Northside Wastewater Treatment Plant (NSWWTP) digesters, per these specifications.
 - 214.3.1 The project located at the City of Tulsa's Northside Wastewater Treatment, consists of removing and replacing the existing differential pressure sensor used for digester level control with the proposed. The project includes the correct and complete installation of new pressure transmitter, as specified herein. It also includes connection of new pressure transmitter to existing controls with existing cable when applicable. All work shall be performed in conformance with the manufacturer's instructions and recommendations for installation, subsequent testing of the new units, and ensuring they are in proper operation, including proper function with the NSWWTP's existing system.
 - 214.3.2 Existing differential pressure assembly to be replaced, its location and the proposed pressure transmitter assembly installation location are shown on the accompanying **WPC25-3** drawing sheets designated as **214.3A through 214.3D**.
 - 214.3.3 Contractor shall be knowledgeable about and shall field verify all elevations and dimensions of existing piping and equipment that in any way bears on the removal of the existing equipment and installation of the proposed equipment. Work shall be based on field measurements. The Authority will make available the information it has pertaining to the existing equipment.
 - 214.3.4 Project work shall include all materials, equipment, labor, and supervision, necessary to complete the project as specified herein, including but not limited to any and all crane work, rigging, delivery and complete installation of components to fully operational and warrantable condition.
 - 214.3.5 Contractor shall submit work plan acceptable to the Engineer describing the duration and sequence of work. Plan shall be approved prior to commencement of work. All work requiring flow stoppage or equipment removed from service must be scheduled 48 hours in advance with Plant Superintendent. It is the contractor's responsibility to prepare the system being worked on for disassembly. This includes coordinating with plant operations the closing of upstream/downstream valves and pumping down any reservoirs necessary.

214.3.5.1 All unneeded equipment and debris from any work shall

become the responsibility of the contractor and shall be removed from the site and disposed of properly.

214.3.6 Remove and replace four (4) existing differential pressure transmitters & four(4) 316L 150# bleed rings and plugs.

> 214.3.6.1 Digester 1&2 The new equipment shall be manufactured by Rosemont Model 30551L3AA0FD11AABLEMCT1F1RK Max Pressure 35 PSIG calibrated for 0 to 1000 in H20 3" 150# 316L connection or approved equal. New gaskets and hardware shall be installed. On digester 1&2 existing pipe spool to go from 150# flange to 300# flange shall be given to plant staff

> 214.3.6.2 Digester 3&4 The new equipment shall be manufactured by Rosemont Model 30551L3AA0FD11AABLEMCT1F1RK Max Pressure 35 PSIG calibrated for 0 to 1000 in H20 3" 150# 316L connection or approved equal. New gaskets and hardware shall be installed.

- 214.3.7 The differential pressure transmitters shall be installed to work with existing control systems, including the NSWWTP's existing system.
- 214.3.8 Contractor shall use caution to avoid damage to existing power and data cables. Existing power and data cables running from MCC and PLC to control boxes shall not be replaced unless damaged. Contractor shall be responsible for any damage to existing electrical equipment or power cables. Power and data cables between control boxes and actuator shall be new.
- 214.3.9 <u>TAGGING</u>: Contractor shall supply equipment tags. Tags shall show the City of Tulsa's Equipment ID number for each pressure transmitter (as listed below) The tags shall be visible without the need to "hunt" for the tags and shall be viewable and readable from eye level. <u>Equipment ID</u> <u>Plates</u>

All equipment tagged on the drawings, except for buried submerged equipment shall be provided with an Equipment ID Plate bearing the equipment tag number identified on the drawings. Equipment ID Plates shall be rectangular 3.5"x .75" and 1/16" thick laminated Blue/White, laminated impact acrylic such as Rowmark UltraMattes 322-512, or equivalent. Lettering shall be 1 line of text, centered, and white capitalized block letters .25" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment IDing scheme.

Equipment ID Plates shall be attached with permanent adhesive.

XXXX-XXXX-XXXXX

VALVE AND GATE EQUIPMENT ID PLATES

Equipment Equipment ID Plates

All valves and gates, except buried or submerged valves, that have been assigned an Equipment ID on the Drawings or in the valve or gate schedule, shall be provided with a permanent number plate. Equipment ID Plates shall be round 1.5" and 1/16" thick laminated blue phenolic plastic engraving stock that is U/V stable. Lettering shall be in 3 sections, centered, and white capitalized block letters 3/16" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment ID Scheme.

Equipment ID Plates shall be attached with permanent ties.



Equipment ID Tag Number:

N080-DIG1-LLC01 N080-DIG2-LLC01 N080-DIG3-LLC01

N080-DIG4-LLC01

214.3.10 <u>TESTING.</u> The pressure transmitters shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. After completion of the installation, the equipment shall be tested by the Contractor under actual operating conditions. An Authorized Manufacturer's Representative shall do onsite verification at Start-Up.

- 214.4 <u>All materials, labor, equipment, and supervision required for removal and replacement of</u> eight (8) actuators at the Northside Wastewater Treatment Plant (NSWWTP) Aeration <u>Basins, per these specifications.</u>
 - 214.4.1 The project located at the City of Tulsa's Northside Wastewater Treatment, consists of removing and replacing the existing air valve actuators with the proposed. The project includes the correct and complete installation of new actuators, as specified herein. It also includes connection of new actuator to existing controls with existing cable where applicable. All work shall be performed in conformance with the manufacturer's instructions and recommendations for installation, subsequent testing of the new units, and ensuring they are in proper operation, including proper function with the NSWWTP's existing system.
 - 214.4.2 Existing actuator assembly to be replaced, its location and the proposed pump assembly installation location are shown on the accompanying WPC25-3 drawing sheets designated as 214.4A, 214.4B, 214.4C, &214.4D.
 - 214.4.3 Contractor shall be knowledgeable about and shall field verify all elevations and dimensions of existing piping and equipment that in any way bears on the removal of the existing equipment and installation of the proposed equipment. Work shall be based on field measurements. The Authority will make available the information it has pertaining to the existing equipment.
 - 214.4.4 Project work shall include all materials, equipment, labor, and supervision, necessary to complete the project as specified herein, including but not limited to any and all crane work, rigging, delivery and complete installation of components to fully operational and warrantable condition.
 - 214.4.5 Contractor shall submit work plan acceptable to the Engineer describing the duration and sequence of work. Plan shall be approved prior to commencement of work. All work requiring flow stoppage or equipment removed from service must be scheduled 48 hours in advance with Plant Superintendent. It is the contractor's responsibility to prepare the system being worked on for disassembly. This includes coordinating with plant operations the closing of upstream/downstream valves and pumping down any reservoirs necessary. It is the responsibility of the contractor to bypass any flow into the wet well during the construction. The Plant Superintendent will instruct the contractor on where to direct bypassed flow.

214.4.5.1 All unneeded equipment and debris from any work shall become

the responsibility of the contractor and shall be removed from the site and disposed of properly.

- 214.4.6 Installation of new motor actuator and mounting brackets and hardware. This item includes the installation of an electrical connection in accordance with Specification Section 204.4.
 - 214.4.6.1 The existing actuators was manufactured by AUMA 20" BFV SAR10 & 10" BFV SAR07 Flange FA12, bore to be verified at time of order, for the Northside Wastewater Treatment Plant. The new equipment shall be manufactured by Rotork or Limitorque. Minimum Torque range: 45-88 ft#, NEMA 4x Enclosure, Modulating, and hand wheel bore to be verified at time of order.

214.4.6.2 Motor:

214.4.6.2.1 Electric Motor Modulating Service:

 Electric motor operator for throttling service on the valves shall meet the requirements of AWWA C504, Electric Operators, except as herein specified.
 Enclosures shall be NEMA 4 unless shown otherwise on Valve Schedule.

The valve operator torque shall be as required for a 150 psi pressure drop across the valve, minimum, except those for low pressure air service. The valve operator torque for low pressure air service valves shall be as required for a 25 psi pressure drop across the valve, minimum.

- b. The housing and covers shall be of cast aluminum or cast iron. Mechanical parts shall be designed for safety factor of at least 2. Construction of the operator shall be such that it may be mounted in any position required to facilitate manual operation. Manual operation of the valves shall be possible by a handwheel attached to the mechanism. Power to motor circuit shall be automatically disconnected to prevent accidental electric operation during manual operation. A mechanical dial position indicator shall be provided to continuously indicate valve position. Operator bearings shall be self-lubricating type or lubricated for life before operator is sealed at the factory.
- c. The operator motor shall be heavy-duty with continuous duty rating and totally enclosed and nonventilated. The motor shall be equipped with thermal overload protection. Operating voltage shall be as listed on Valve Schedule.
- d. The winding temperature rise shall meet NEMA standard for the class of insulation used at the rated service factor load. The motor shall be for high torque variable speed duty. The motor shall be reversible. A 4-20 mA throttling

signal shall be provided by others. Control interface electronics, motor controller, and appurtenances to accept this signal and position the valve between 0 and 90 degrees based on the value of the modulating signal shall be provided with the valve operator. The controller shall be provided complete with NEMA 4 enclosure, Auto-Manual selector switch and Open, Close push-buttons. Controller shall be completely solid state; contactors are not acceptable. Motor and controller shall be suitable for over 1,000 starts per hour. Controllers shall accept an isolated 4-20 mA signal for valve positioning from a remote source. Valve operators shall be equipped to be field adjustable to fail open, fail closed, or fail in place upon loss of control signal (4-20 mA). Valves shall be set up to fail in place unless otherwise noted on Valve Schedule.

- e. The gear train shall be pre-selected to have open-close operating time from 1 to 3 minutes as shown on Valve Schedule.
- f. Limit switches shall be provided at the extreme open and close position of the operator travel. At least 2 independent switches at each end of motor travel shall be provided as standard for a local indicator and interlocking. An additional switch shall be provided at each end for remote use.
- g. Motor circuit limit switches shall be of the direct break type. Limit switches shall be adjustable. Limit switch contacts shall be isolated. Auxiliary switches for secondary functions shall be of the cam-operated, spring leaf type. The operator shall be equipped with a torque switch for protection in the closing direction. An electrical or mechanical interlock shall be provided to prevent the open torque switch from tripping when unseating a torque-seated valve. In the event of power failure, the operator shall lock in the last control position until power is restored or switched over to standby power or the manual operating handwheel is engaged.
- h. Torque switches, limit switches, and motor thermal switches are to be mounted as required inside the housing and connected to the master terminal strip. Provisions shall be made for 2 internal potentiometers for feedback control operations and for remote valve position indicator. Wiring within operator shall be incorporated in a standard laced wiring harness using compression connectors and terminal strips. Internal wiring shall be UL approved for 105 degrees C operation. Insulation shall be suitable for 600 volts.
- Wires shall be tagged at each end of the wire with individual wire markers.
 Each terminal of the terminal strips shall be numbered and identified with a

marker. Schematics shall be provided with Shop Drawings showing wire numbers, terminals, field wiring, etc. Connections for remote equipment shall be wired to terminal blocks. Equipment shall be factory wired and tested before shipment.

- j. All electrical motor actuators to be provided by local actuator servicing representative, expect aeration control valves. Local actuator servicing representative to provide mounting and all adapters required for a complete functioning valve system. Contractor to install valve, adapters, and electric actuators.
- 214.4.6.2.2 Control Package: The control package shall consist of indicating lights, Open-Close-Stop push-button stations, Local-Remote control selector, strip headers, and wiring factory assembled, mounted in a NEMA 4 enclosure unless otherwise noted on Valve Schedule.
- 214.4.7 The actuators shall be installed to work with existing control systems, including the NSWWTP's existing system.
- 214.4.8 Contractor shall use caution to avoid damage to existing power and data cables. Existing power and data cables running from MCC and PLC to control boxes shall not be replaced unless damaged. Contractor shall be responsible for any damage to existing electrical equipment or power cables. Power and data cables between control boxes and actuator shall be new.
- 214.4.9 <u>TAGGING</u>: Contractor shall supply equipment tags. Tags shall show the City of Tulsa's Equipment ID number for each actuator (as listed below) The tags shall be visible without the need to "hunt" for the tags and shall be viewable and readable from eye level. Equipment ID Plates

All equipment tagged on the drawings, except for buried submerged equipment shall be provided with an Equipment ID Plate bearing the equipment tag number identified on the drawings. Equipment ID Plates shall be rectangular 3.5"x .75" and 1/16" thick laminated Blue/White, laminated impact acrylic such as Rowmark UltraMattes 322-512, or equivalent. Lettering shall be 1 line of text, centered, and white capitalized block letters .25" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment IDing scheme.

Equipment ID Plates shall be attached with permanent adhesive.



VALVE AND GATE EQUIPMENT ID PLATES

Equipment Equipment ID Plates

All valves and gates, except buried or submerged valves, that have been assigned an Equipment ID on the Drawings or in the valve or gate schedule, shall be provided with a permanent number plate. Equipment ID Plates shall be round 1.5" and 1/16" thick laminated blue phenolic plastic engraving stock that is U/V stable. Lettering shall be in 3 sections, centered, and white capitalized block letters 3/16" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment ID Scheme.

Equipment ID Plates shall be attached with permanent ties.



Equipment ID Tag Number:

N040-ARB1-ACT01	N040-ARB1-ACT02
N040-ARB2-ACT01	N040-ARB2-ACT02
N040-ARB3-ACT01	N040-ARB3-ACT02
N040-ARB4-ACT01	N040-ARB4-ACT02

214.4.10 <u>TESTING.</u> The actuators shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. After completion of the installation, the equipment shall be tested by the Contractor under actual operating conditions. An Authorized

Manufacturer's Representative shall do onsite verification at Start-Up.

- 214.5 <u>All materials, labor, equipment, and supervision required for removal and replacement of</u> four (4) Scum actuators at the Northside Wastewater Treatment Plant (NSWWTP) Final <u>Clarifiers, per these specifications.</u>
 - 214.5.1 The project located at the City of Tulsa's Northside Wastewater Treatment, consists of removing and replacing the existing scum drive actuators with the proposed. The project includes the correct and complete installation of new actuator, as specified herein. It also includes connection of new actuator to existing controls with existing cables where applicable. All work shall be performed in conformance with the manufacturer's instructions and recommendations for installation, subsequent testing of the new units, and ensuring they are in proper operation, including proper function with the NSWWTP's existing system.
 - 214.5.2 Existing actuator assembly to be replaced, its location and the proposed actuator assembly installation location are shown on the accompanying **WPC25-3** drawing sheets designated as **214.5A to 214.5F**.
 - 214.5.3 Contractor shall be knowledgeable about and shall field verify all elevations and dimensions of existing piping and equipment that in any way bears on the removal of the existing equipment and installation of the proposed equipment. Work shall be based on field measurements. The Authority will make available the information it has pertaining to the existing equipment.
 - 214.5.4 Project work shall include all materials, equipment, labor, and supervision, necessary to complete the project as specified herein, including but not limited to any and all crane work, rigging, delivery and complete installation of components to fully operational and warrantable condition.
 - 214.5.5 Contractor shall submit work plan acceptable to the Engineer describing the duration and sequence of work. Plan shall be approved prior to commencement of work. All work requiring flow stoppage or equipment removed from service must be scheduled 48 hours in advance with Plant Superintendent. Contractor shall have materials as necessary at the installation site prior to any flow stoppage. It is the contractor's responsibility to prepare the system being worked on for disassembly. This includes coordinating with plant operations the closing of upstream/downstream valves and pumping down any reservoirs necessary.
 - 214.5.5.1 All unneeded equipment and debris from any work shall become the responsibility of the contractor and shall be

removed from the site and disposed of properly.

- 214.5.6 Installation of new motor actuator, stem connection rod, stem cover two limit switches. This item includes the installation of an electrical connection in accordance with Specification Section 204.4.
 - 214.5.6.1 Current scum pipe actuators are AUMA Model SA07.5 The new equipment shall be manufactured by Rotork or Limitorque electric driven worm gear actuator with torque and limit switches and a manual override handwheel operator mounted on a heavy duty steel weldment floor stand, a bottom exit output shaft, an integrated motor, gearing, adjustable torque protection each direction, torque capacity as required to operate the scum pipe. an operating hand wheel interlocked with the motor, a position indicator, position limit switches, capacity for two consecutive full cycle operations under any conditions, and shall be selflocking. Limits of pipe rotation shall be controlled by four (4) position limit switches in the electrical operator, each individually and infinitely adjustable from weir closed to weir crest one inch below the bottom of the basin V-notch weirs. Each switch shall include three isolated, reversible or double throw contacts rated 6 amps at 120v, single phase. The operator position indicator shall indicate scum pipe elevation relative to the elevation of the bottom of the basin V-notch weirs. All components of the rotating scum pipe drive system shall be suitable for use in a sewage basin by either the use of corrosion resistant materials or the use of completely weatherproof sealed housings. The motor shall operate on 460 volt, 3 phase, 60Hz power.
 - 214.5.7 The actuators shall be installed to work with NSWWTP's existing control systems, including the automatic rotating scum pipe control system and clarifier control panel. A HAND-OFF-AUTO selector switch shall be provided in the clarifier control panel. The starter for the rotating scum pipe shall be integral to the actuator In AUTO control selection,

the dipping cycle shall be initiated once the proximity switch is activated. Once the proximity switch is activated, the scum pipe shall rotate to the preset "weir depth" after a field adjustable time delay of 0-10 minutes. Once the scum pipe has reached the "weir depth", that position shall be maintained for a field adjustable duration of 0-10 minutes and then the scum pipe will return to its fully raised position. The "weir depth" position shall be field adjustable at the rotating scum pipe actuator.

Automatic controls shall be failsafe and immune to voltage outages to maintain the rotating scum pipe closed, except during operation. In HAND control selection, the rotating scum pipe is controlled locally at the actuator.

- 214.5.8 Contractor shall use caution to avoid damage to existing power and data cables. Existing power and data cables running from MCC and PLC to control boxes shall not be replaced unless damaged. Contractor shall be responsible for any damage to existing electrical equipment or power cables. Power and data cables between control boxes and actuator shall be new.
- 214.5.9 <u>TAGGING</u>: Contractor shall supply equipment tags. Tags shall show the City of Tulsa's Equipment ID number for each actuator (as listed below) The tags shall be visible without the need to "hunt" for the tags and shall be viewable and readable from eye level. <u>Equipment ID Plates</u>

All equipment tagged on the drawings, except for buried submerged equipment shall be provided with an Equipment ID Plate bearing the equipment tag number identified on the drawings. Equipment ID Plates shall be rectangular 3.5"x .75" and 1/16" thick laminated Blue/White, laminated impact acrylic such as Rowmark UltraMattes 322-512, or equivalent. Lettering shall be 1 line of text, centered, and white capitalized block letters .25" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment IDing scheme.

Equipment ID Plates shall be attached with permanent adhesive.



VALVE AND GATE EQUIPMENT ID PLATES

Equipment Equipment ID Plates

All valves and gates, except buried or submerged valves, that have been assigned an Equipment ID on the Drawings or in the valve or gate schedule, shall be provided with a permanent number plate. Equipment ID Plates shall be round 1.5" and 1/16" thick laminated blue phenolic plastic engraving stock that is U/V stable. Lettering shall be in 3 sections, centered, and white capitalized block letters 3/16" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment ID Scheme.

Equipment ID Plates shall be attached with permanent ties.



Equipment ID Tag Numbers:

N050-FCL1-MSP01

N050-FCL2-MSP01

N050-FCL3-MSP01

N050-FCL4-MSP01

214.4.10 <u>TESTING.</u> The actuators shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. After completion of the installation, the equipment shall be tested by the Contractor under actual operating conditions. An Authorized Manufacturer's Representative shall do onsite verification at Start-Up.

- 214.6 <u>All materials, labor, equipment, and supervision required for removal and replacement of</u> four (4) WEMCO grit cyclones cyclones & associated valves, piping, & attachments at the Northside Wastewater Treatment Plant (NSWWTP) Headworks Building, per these specifications.
 - 214.6.1 The project located at the City of Tulsa's Northside Wastewater Treatment, consists of removing and replacing the existing WEMCO grit cyclones with the proposed. The project includes the correct and complete installation of new cyclones, plug valves, pressure gauge, and piping as specified herein. All work shall be performed in conformance with the manufacturer's instructions and recommendations for installation, subsequent testing of the new units, and ensuring they are in proper operation, including proper function with the NSWWTP's existing system.
 - 214.6.2 Existing grit cyclone assembly to be replaced, its location and the proposed assembly installation location are shown on the accompanying **WPC25-3** drawing sheets designated as **214.6A & 214.6B**.
 - 214.6.3 Contractor shall be knowledgeable about and shall field verify all elevations and dimensions of existing piping and equipment that in any way bears on the removal of the existing equipment and installation of the proposed equipment. Work shall be based on field measurements. The Authority will make available the information it has pertaining to the existing equipment.
 - 214.6.4 Project work shall include all materials, equipment, labor, and supervision, necessary to complete the project as specified herein, including but not limited to any and all crane work, rigging, delivery and complete installation of components to fully operational and warrantable condition.
 - 214.6.5 Contractor shall submit work plan acceptable to the Engineer describing the duration and sequence of work. Plan shall be approved prior to commencement of work. All work requiring flow stoppage or equipment removed from service must be scheduled 48 hours in advance with Plant Superintendent.
 - 214.6.5.1 All unneeded equipment and debris from any work shall become the responsibility of the contractor and shall be removed from the site and disposed of properly.
 - 214.6.6 Installation of new cyclones, valves, and pressure gauging equipment.

214.6.6.1 The existing cyclones are manufactured by WEMCO WEMCLONE 1000C 4" inlet, 6" outlet, 4" vortex finder. The new equipment shall be manufactured by WEMCO. Valves to be dezuirk 12.00-1D eccentric plug valves or approved equal. Four (4) 22 degree ductile iron elbows, Four (4) 90 degree ductile elbows, new 0-60 PSIG 6" dial ashcroft pressure gauge or approved equal, 316L glycerin diaphragm seal, 316L 9" TBE schedule 40 nipple. 316L 1x ½" bushing, and new 316L hardware.

214.6.6.2 **General Rating:** Valve shall be of full lug or full flange flat face-to-face design. Valve will have threaded flange bolt holes to permit independent upstream or downstream pipe flange removal without affecting the shutoff or body shell pressure rating of the valve.

214.6.6.2 **Pressure Rating:**

214.6.6.2.1: Body shell pressure rating shall be 150 psig CWP.

214.6.6.2.2: Standard Shut off pressure rating shall be 150 psi.

214.6.6.2.3: The valve body shall be tested at 1.5 times the rated pressure and the valve gate at 1.1 times the rated pressure while in the fully shut position with zero cc/min leakage permitted past the seat or to valve exterior.

214.6.6.3 Materials:

214.6.6.3.1: shall be of cast iron per ASTM A126 Class B. Flanged end valves shall be of the AWWA C504 short body design with Class 125 flanged ends faced and drilled per ASME B16.1 standard for cast iron flanges. Mechanical Joint end valves shall meet the requirements of AWWA C111/ANSI 21.11.

214.6.6.3.2 shall meet or exceed the requirements of the latest revision of AWWA Standard C504 for Class 150B plug valves. Valves 4" and smaller shall have a working pressure of 200 psi (1380 kPa). When customer specified, valves shall meet NSF/ANSI 61/372.

214.6.6.3.3: shall be designed and tested per the requirements of AWWA C504. Handwheel AWWA nut input. All units shall have independently adjustable open and closed position stops that are adjustable under full line pressure and

flow. Open and closed position stop adjustments shall not require the removal of any load or torque transmitting components.

214.6.6.3.4:

- 214.6.6.4 **Design:**
 - **214.6.6.4.1:** See attached 5600F-5700F spec sheet for additional information on the plug valves
- 214.6.6.5 **Valve Operators:** Valves identified in the drawings as manually operated shall be oriented so that the valve indicator is visible during operation of the valve. Valve wheel to match existing valves.
- 214.6.6.6 **Coatings:** All non stainless steel metal surfaces shall be prepped, blasted, chip resistant primed, and Painted to match the other grit line.
- 214.6.7 <u>INSTALLATION:</u> The valves & cyclones shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. All fasteners shall be 316 stainless steel and a nickel based anti-seize shall be applied to threaded fasteners during assembly. Contractor shall provide the piping necessary for any modifications to connect the proposed valves into the existing hard piping systems.
- 214.6.8 Contractor shall use caution to avoid damage to existing power and data cables. . Contractor shall be responsible for any damage to existing electrical equipment or power cables. Power and data cables between control boxes and actuator shall be new.
- 214.6.9 <u>TAGGING</u>: Contractor shall supply equipment tags. Tags shall show the City of Tulsa's Equipment ID number for each grit cyclone (as listed below) The tags shall be visible without the need to "hunt" for the tags and shall be viewable and readable from eye level. <u>Equipment ID Plates</u>

All equipment tagged on the drawings, except for buried submerged equipment shall be provided with an Equipment ID Plate bearing the equipment tag number identified on the drawings. Equipment ID Plates shall be rectangular 3.5"x .75" and 1/16" thick laminated Blue/White, laminated impact acrylic such as Rowmark UltraMattes 322-512, or equivalent. Lettering shall be 1 line of text, centered, and white capitalized block letters .25" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment IDing scheme.

Equipment ID Plates shall be attached with permanent adhesive.

XXXX-XXXX-XXXXX

VALVE AND GATE EQUIPMENT ID PLATES

Equipment Equipment ID Plates

All valves and gates, except buried or submerged valves, that have been assigned an Equipment ID on the Drawings or in the valve or gate schedule, shall be provided with a permanent number plate. Equipment ID Plates shall be round 1.5" and 1/16" thick laminated blue phenolic plastic engraving stock that is U/V stable. Lettering shall be in 3 sections, centered, and white capitalized block letters 3/16" high and engraved to a depth of 0.08mm.

Equipment ID Plates must follow the Equipment ID Scheme.

Equipment ID Plates shall be attached with permanent ties.



Equipment ID Tag Number:

N010-HDW1-CYC01

N010-HDW1-CYC02

N010-HDW1-CYC03

N010-HDW1-CYC04

214.6.10 <u>TESTING.</u> The grit hopper cyclones, valves, and pressure gaurges shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. After completion of the installation, the equipment shall be tested by the Contractor under actual operating conditions. An Authorized Manufacturer's Representative shall do onsite verification at Start-Up.

- 214.98 <u>Extra Work Allowance \$35,000.00 Lump Sum Allowance for various mechanical, electrical,</u> plumbing, or unforeseen circumstances work not identified in the bid items.
 - 214.98.1 The allowance shall be used for cost of materials, labor, installation, and overhead and profit for additional MEP/Unforeseen Circumstances work that is not identified in the base bid items.
 - 214.98.2 The allowance shall be used only at the discretion of the City of Tulsa. Any allowance balance remaining at the completion of the contract will be credited back to the City of Tulsa on the final Application for Payment submitted by the contractor.
 - 214.98.3 The contractor shall provide to the City of Tulsa representative a written request for the use of any of the allowance with a schedule of values and all associated backup information.
 - 214.98.4 The contractor shall proceed with Extra Work included in the allowance only after receiving a written order from the City of Tulsa representative authorizing such work. Proceeding with work expected to be covered in the allowance without a written order from the City of Tulsa representative will be at the contractor's risk. Contractor may not be paid for unapproved work/materials at the discretion of the City of Tulsa representative.
 - 214.98.5 Any additional costs for bonds and insurance shall not be included in any Extra Work allowance because this cost is already included in the contract.

- 214.99 <u>Mobilization Bid Item A mobilization bid item is included to help cover initial costs of bonds,</u> insurance, permits, submittal preparation and other incidental costs.
 - 214.99.1 Payment shall be made for a Mobilization Bid Item which is intended to cover the costs of bonds, insurance, permits, submittal preparation and other incidental costs. Payment of the Mobilization Bid Item maybe be requested in full on the first payment application. The Mobilization Bid Item shall not exceed five percent (5%) of the sum of all Base Bid Items excluding the Mobilization Bid Item. Add Alternate Items are not part of the Base Bid Items.