



WATER AND SEWER
Engineering Design

DATE:
February 25, 2025

TO:
Plan Holders

FROM:
Jenna Richardson

Contractors

918-596-9637

jennarichardson@cityoftulsa.org

EMAIL TRANSMITTAL

ADDENDUM NO. 2

**PROJECT NO. ES 2022-10 CITYWIDE LIFT STATION
IMPROVEMENTS TURLEY NORTH LIFT STATION**

Number of pages: **34**

Please email a signed cover sheet to kteel@cityoftulsa.org
as acknowledgement of receipt.

Thank you,

Signature

Company

Date



WATER AND SEWER
Engineering Design

DATE:
February 25, 2025

**ADDENDUM NO. 2
TO
PROJECT NO. ES 2022-10
CITYWIDE LIFT STATION IMPROVEMENTS
TURLEY NORTH LIFT STATION**

This Addendum No. 2 consisting of thirteen (13) items, submitted by Holloway, Updike, and Bellen, Inc. is hereby made a part of the Contract Documents to the same extent as though it were originally included therein and shall supersede anything contained in the Plans and Specifications with which it might conflict. **All addenda to the contract documents should be denoted on the last page of the Proposal in the space provided.**

This Addendum No. 2 consists of the following:

1. The attached documents list the detail items that have been modified in Addendum No. 2. These documents shall be inclusive and apply to this project.
2. Delete the existing Proposal in its entirety and replace with the revised Proposal found at <https://www.cityoftulsa.org/government/departments/engineering-services/construction-bids/> for Project No. ES 2022-10 Citywide Lift Station Improvements Turley North Lift Station. It is the Bidders responsibility to download the revised Proposal.

All other provisions of the Plans and Specifications shall remain in full force and effect.

CITY OF TULSA

FOR Eric Lee
Director

HAS/JP/ATL/JR/kt

1000 x 1000

TUL * USA



ENGINEERS

**ADDENDUM NO. 2
FEBRUARY 25, 2025**

**PROJECT NO. TMUA ES 2022-10
CITYWIDE LIFT STATION IMPROVEMENTS
TURLEY NORTH LIFT STATION**

This Addendum No. 2, consisting of thirteen (13) items are hereby made a part of the Contract Documents to the same extent as though it were originally included therein, and shall supersede anything contained in the Plans and Specifications with which it might conflict. **All addenda to the contract documents should be denoted on the last page of the Proposal in the space provided. Failure to do so shall result in the bid being deemed non-responsive.**

CONTRACT DOCUMENTS:

1. BID PROPOSAL:

Delete the existing Proposal in its entirety and replace with the attached revised Proposal for Project TMUA ES 2022-10, Citywide Lift Station Improvements. For clarification, the new proposal has been changed to update alternate bid items.

The revised electronic proposal is found at:

<https://www.cityoftulsa.org/government/departments/engineering-services/construction-bids/>

It is the Bidders responsibility to download the revised Proposal onto their thumb drive.

VOLUME II - SPECIFICATIONS:

2. DELETE SPECIFICATION SECTION 11.2 SUBMERSIBLE PUMP SYSTEM AND REPLACE WITH THE ATTACHED SPECIFICATION MARKED "ADDENDUM 2".
- a. For clarification, the revised Specification Section 11.2 contains changes to the Control Panel materials, VFD requirements, corrects pump motor horsepower requirements, and corrects references to motor starters. Revised paragraphs are in bold, italic font.

3. MODIFY SPECIFICATION SECTION 16.7 ENGINE GENERATOR TO INCLUDE THE FOLLOWING:
 - a. Part 2.1.A – “The generator set shall be a MTU model, **or Kohler (Rehiko) model 60REOXK.**
 - b. Part 2.1.H.1 – Model basler DCG 2020, **or Kohler model APM402.**

VOLUME III - CONSTRUCTION DRAWINGS:

4. REMOVE AND REPLACE THE FOLLOWING PLAN SHEETS:
 - a. LOCATION MAP & QUANTITIES SUMMARY (SHEET 2)
 - b. TURLEY NORTH LS DEMOLITION PLAN (SHEETS 8)
 - c. TURLEY NORTH LS SITE IMPROVEMENTS (SHEET 9)
 - d. TURLEY NORTH LS PAVING & GRADING IMPROVEMENTS (SHEET 10)
 - e. TURLEY NORTH LS PLAN AND PROFILE (SHEET 11)
 - f. TURLEY NORTH LIFT STATION SECTIONS (SHEET 14)
 - g. TURLEY NORTH LS MISCELLANEOUS DETAILS (SHEET 20)

INFORMATION TO BIDDERS:

The following are questions from contractors and correlating responses:

5. Question: The existing manhole 023-0242 is a brick manhole (see attached image). Since this project requires tying into this manhole, does the City of Tulsa want it replaced?
 - o If the City prefers to retain the manhole, will an epoxy coating be required?

Answer: See ADDENDUM NO. 2. ADDITIVE ALTERNATE NO. 2 has been added for the replacement of said manhole and all corresponding work associated.

6. If the City opts to replace the manhole with a precast structure, would the contractor need to create a penetration to keep the existing lift station operational? Or would penetrations only be required for tying in the existing 8” and 10” lines along with the proposed 12” influent?
 - o **Note:** Sheet 11, Note 1.B states that the existing lift station must be isolated for 14 days to ensure trouble-free operation of the new lift station. However, the contractor would be able to bypass from proposed manhole MHS-A to the existing wet well if an issue arises during this 14-day period.

Answer: See ADDENDUM NO. 2. ADDITIVE ALTERNATE NO. 2 has been added for the replacement of said manhole and all corresponding work associated. Contractor shall provide stand-by, bypass pumping in lieu of keeping the old station online.

7. Question: Sheet 20 Detail 1/20 is calling for Tack Coat under the proposed concrete paving. Is this note correct or is this note to be removed?

Answer: See ADDENDUM NO. 2. Note for Tack Coat has been removed.

8. Question: 11.2 Submersible Pump System, 2.2 Control System, D. Components - Section mentions both VFDs and motor starters. Are both components to be provided in the panel as redundancy?

Answer: Specifications have been revised to require VFDs with integral bypass motor starters.

9. Question: 11.2 Submersible Pump System, 2.2 Control System, D. Components - Item 7 requires a switch to select alternation. Item 9 requires PLC to perform alternation. Please clarify.

Answer: Both. The switch is used to select lead pump or alternate (in lieu of having to enter through the PanelView). The PLC performs the functions.

10. Question: 11.2 Submersible Pump System, 2.2 Control System, E. Level Control System - Item 5 mentions PID control. Should the pump speed be varied to maintain a constant level in the station? Or should they be operated at a fixed speed between set points?

Answer: Paragraph 2.2.E.5. states that pump speed will vary.

11. Question: 11.2 Submersible Pump System, 2.2 Control System, E. Level Control System - Please confirm the level sensing probe should be the primary controller, with the submersible transducer as backup.

Answer: Paragraph 2.2.E.2. states that the probe is primary. 2.2.E.3. states the transducer is secondary.

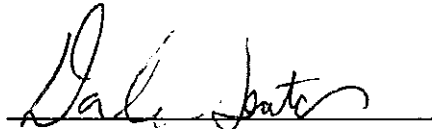
12. Question: 11.2 Submersible Pump System, 2.2 Control System, D. Components - Item 19 - A limit switch for the check valve is not shown on any plans. Security alarm is not defined in this section. Please clarify.

Answer: Check valve limit switch requirements are shown on Sheet E3. Provide the Security alarm PLC functionality as stated. There won't be an input from an actual security alarm in this phase of construction.

13. Question: The proposed basket screen being square in shape will not work with the proposed round manhole wall. Can you please advise if a modification to the basket screen is to be made or if the vault should be adjusted to be a square vault.

Answer: See ADDENDUM NO. 2. Contractor shall grout fill and lag bolt guide rail system to manhole wall to provide flush surface for basket screen.

HOLLOWAY, UPDIKE AND BELLEN, INC.


Dale Seaton, P.E.
Principal



END OF ADDENDUM NO. 2

**ELECTRONIC BID PROPOSAL INSTRUCTIONS - EXCEL SPREADSHEET
CITYWIDE LIFT STATION IMPROVEMENTS - TURLEY NORTH LIFT STATION
TMUA PROJECT NO. ES 2022-10**

Please read the following instructions carefully.

1. After opening this file re-save it as your company's name.
2. Open the BID FORM Sheet from the tabs below.
3. Input the unit price of the appropriate pay item in the cells highlighted in blue.
4. Review all data input and check calculations to ensure accuracy of Bid.
5. Print 1 hardcopy of the "PROPOSAL" tab, BID FORM and the "SIGNATURE PAGE" tab.
6. Complete and sign the "Signature Page" document.
6. Submit hardcopy and electronic disk with Contract Documents and Specifications for Bid opening date.

NOTES:

1. The sheet named "FOR CONTRACTOR USE" shall be used by the contractor to export data to estimating software.

LEGEND

- \$ 1.00 Cells Requiring Data Input.
- \$ 1.00 Internal Data Transfer.
- \$ 2.00 Calculated Results.

AGREEMENT FOR USING ELECTRONIC BID PROPOSAL

By and Between: Holloway, Updike & Bellen, Inc. (ENGINEER) and RECIPIENT. The enclosed electronic media is provided pursuant to your request and is for your limited use in connection with your submittal of Bid Proposal for Project No. ES 2022-10 - Citywide Lift Station Improvements - Turley North Lift Station. In no event shall the information be used for any other purpose or be released to third parties without the written consent of the ENGINEER. In the event of a discrepancy between the hard copy and this electronic media at delivery or in the future, the hard copy shall govern. ENGINEER hereby disclaims any and all liability for the consequences from use of the electronic media and makes no warranty or guarantee of accuracy. RECIPIENT shall assume full responsibility for the uses and consequences of the electronic media. It is agreed that ENGINEER has and retains ownership of the electronic media. ENGINEER does not warrant or guarantee that the electronic data is compatible with RECIPIENT'S computer hardware or software, and ENGINEER'S responsibility for the electronic media is limited to replacement of defective media for a period of thirty (30) days after delivery to RECIPIENT. !!! By opening and using this FILE, You AGREE to these TERMS AND CONDITIONS!!!

PROPOSAL
CITYWIDE LIFT STATION IMPROVEMENTS - TURLEY NORTH LIFT STATION
TMUA PROJECT NO. ES 2022-10

TO: TULSA METROPOLITAN UTILITY AUTHORITY
CITY OF TULSA, OKLAHOMA

THE UNDERSIGNED BIDDER, having carefully examined the drawings, specifications, and other Contract Documents of the above project presently on file in the City Clerk, City of Tulsa, Oklahoma:

CERTIFIES THAT he has inspected the site of the proposed work and has full knowledge of the extent and character of the work involved, construction difficulties that may be encountered, and materials necessary for construction, class and type of excavation, and all other factors affecting or which may be affected by the specified work; and

CERTIFIES THAT he has not entered into collusion with any other bidder or prospective bidder relative to the project and/or bid; and

HEREBY PROPOSES to enter into a contract to provide all necessary labor, materials, equipment and tools to completely construct and finish all the work required by the Contract Documents referred to therein; to complete said work within **365 calendar days** after the work order is issued; and to accept in full payment therefore the amount set forth below for all work actually performed as computed by the Engineers as set forth in the Contract.

Basis of Award

IT SHOULD BE NOTED THAT THE LOWEST RESPONSIBLE BID SHALL BE DETERMINED BY THE TOTAL BASE BID PLUS ADDITIVE ALTERNATES NO. 1 AND NO. 2 (BASIS OF AWARD). THE ITEMS IN ADDITIVE ALTERNATES NO. 1 AND NO. 2 MAY OR MAY NOT BE INCLUDED IN THE CONTRACT AWARD AT THE SOLE DISCRETION FO THE CITY OF TULSA. ANY PROPOSAL SUBMITTED WITH ADDITIVE ALTERNATES NO. 1 AND NO. 2 INCOMPLETE SHALL BE CONSIDERED NON-RESPONSIVE.

Note: - Item numbers omitted are not a part of the Contract.

**PROPOSAL FOR
CITYWIDE LIFT STATION IMPROVEMENTS - TURLEY NORTH LIFT STATION**

ITEM NUMBER	SPEC NUMBER	ITEM DESCRIPTION	UNIT	QUANTITY	DATA INPUT UNIT PRICE	AMOUNT
LIFT STATION IMPROVEMENTS						
1	201(A)	CLEARING AND GRUBBING	EA	1		
2	220	SWPPP	EA	1		
3	221(C)	TEMPORARY SILT FENCE	LF	442		
4	230(A)	SOLID SLAB SODDING	SY	178		
5	303(A)	AGGREGATE BASE TYPE 'A'	CY	175		
6	306	18" REINFORCED CONCRETE PIPE	LF	75		
7	310(B)	SUBGRADE METHOD 'B' - 6"	SY	751		
8	312	6" DIP, WYE, RJ	EA	1		
9	312	6" DIP, SLEEVE, RJ	EA	1		
10	317	6" PLUG VALVE	EA	1		
11	312	6" 45 DEGREE BEND, RJ	EA	2		
12	325	SEPARATOR FABRIC	SY	532		
13	335	CONTRACTOR QUALITY CONTROL	LS	1		
14	335	CONTRACTOR AS-BUILT	EA	1		
15	405	6" PVC C900 DR18	LF	66		
16	405	12" PVC - SDR 35 OPEN CUT	LF	48		
17	414(A)	P.C. CONCRETE PAVEMENT (PLACEMENT)	SY	700		
18	414(B)	P.C. CONCRETE PAVEMENT - REINFORCED	CY	136		
19	509(B)	CLASS 'A' CONCRETE	CY	141		
20	611(A)	4' PRECAST MANHOLE, COMPLETE	EA	1		
21	611(A)	VERTICAL FOOT OF MANHOLE DEPTH OVER 6'	VF	6		
22	613(M)	CULVERT END TREATMENT	EA	4		
23	624	SECURITY FENCE AND GATES	LF	320		
24	641	MOBILIZATION	EA	1		
25	642	CONSTRUCTION STAKING	EA	1		
26	COT 702	CONCRETE DRIVEWAY	SY	250		
27	SPECIAL	TURLEY NORTH LIFT STATION IMPROVEMENTS	EA	1		
28	SPECIAL	TURLEY NORTH LIFT STATION DEMOLITION	EA	1		
29	SPECIAL	OWNER'S ALLOWANCE	ALLOW	100,000	\$1.00	\$100,000.00
TOTAL BASE BID						\$100,000.00
ADDITIVE ALTERNATE NO. 1						
30	SPECIAL	ADDITIONAL LIFT STATION PUMP, NOT INSTALLED	EA	1		
TOTAL ADDITIVE ALTERNATE NO. 1						
ADDITIVE ALTERNATE NO. 2						
31	611(A)	4 FOOT PRECAST MANHOLE, COMPLETE	EA	1		
TOTAL ADDITIVE ALTERNATE NO. 2						

TOTAL BASE BID	\$100,000.00
ADDITIVE ALTERNATE NO. 1	_____
ADDITIVE ALTERNATE NO. 2	_____
TOTAL BASIS OF AWARD (BASE BID)	\$100,000.00

Enclosed is a () Bidder's Surety Bond, () Certified Check, () Cashier's Check for
_____ Dollars _____

which the City of Tulsa may retain or recover as liquidated damages in the event that the undersigned fails to enter into contract for the work covered by this proposal, provided the Contract is awarded to the undersigned within thirty (30) days, or within ninety (90) days if Federal funds are utilized, from the date fixed for opening of bids and the undersigned fails to execute said Contract and furnish the required bonds and other requirements as called for in these Contract Documents within thirty (30) days after award of Contract.

Dated at Tulsa, Oklahoma, this _____ day of _____, 20__.

Respectfully submitted,

(Complete legal name of company)

(State of Organization)

By: _____
Title: _____
Printed Name: _____

ATTEST: _____
Title: Corporate Secretary
Printed Name: _____

Address: _____

Telephone Number: _____ Fax Number: _____

The undersigned acknowledge receipt of the following Addenda (give number and date of each):

PART 1 - GENERAL**1.1 SUMMARY**

- A. This section of the specification describes requirements for a submersible pumping system to be installed at the Turley North Lift Station including two (2) submersible pumps and control system. The equipment shall be installed as shown on the plans, as recommended by the supplier, and in compliance with all OSHA, local, state and federal codes and regulations.

1.2 WARRANTY

- A. Pump manufacturer shall furnish to the City a warranty written expressly from the manufacturer to the City of Tulsa, covering workmanship, material, and performance deficiency under normal use and service. The full warranty shall cover 100 percent of parts and labor for at least 24 months. After that, the equipment shall be covered by a pro-rated warranty with the following minimum provisions:
1. From 25 to 39 months after acceptance: 50 percent of all replacement parts and labor for defective materials, workmanship, and performance deficiency.
 2. From 40 to 60 months after acceptance: 25 percent of all replacement parts and labor for defective materials, workmanship, and performance deficiency.
- B. The warranty period shall commence on the day of start-up acceptance by the City. Warranty shall be in printed form and previously published as the manufacturer's standard warranty for similar manufactured units.

PART 2 - PRODUCTS**2.1 SUBMERSIBLE PUMPS**

- A. Conditions of Operation:

Each pump shall be capable of providing the following hydraulic conditions when pumping domestic sewage:

SUBMERSIBLE PUMP SYSTEM

11.2 - 2

Item	Pumps 1 & 2
Pump Type	Submersible, Solids Handling
Primary Design Point:	
Capacity	525 gpm
Total Dynamic Head	52 ft.
Minimum Pump Efficiency at Design	65%
Maximum Speed	1800 rpm
Shutoff Head	97 ft.
Minimum Solid Size	3 in.
Discharge Size	4.0 in.
Motor Hp, Maximum	15 hp
Voltage	460V, 3PH, 60HZ
Drive	Variable Speed

The pump(s) shall be manufactured by:

1. Fairbanks-Nijhuis, Inc., as provided by Haynes Equipment Company, Oklahoma City, Oklahoma
2. Grundfos, Inc., as provided by Haynes Equipment Company, Oklahoma City, Oklahoma
2. Flygt, Inc., as provided by Automatic Engineering., Tulsa, Oklahoma
3. Approved alternate equipment and suppliers listed by addendum.

Design: The pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable. No portion of the pump shall bear directly on the sump floor.

- B. Pump Construction: Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or optional Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in

two planes and O-ring contact of four sides without the requirement of a specific torque limit.

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

- C. **Cooling System:** Each unit shall be provided with an integral motor cooling system. A motor cooling jacket shall encircle the stator housing, providing for dissipation of motor heat regardless of the type of pump installation. An impeller, integral to the cooling system and driven by the pump shaft, shall provide the necessary circulation of the cooling liquid through the jacket. The cooling liquid shall pass about the stator housing in the closed loop system in turbulent flow providing for superior heat transfer. The cooling system shall have one fill port and one drain port integral to the cooling jacket. The cooling system shall provide for continuous pump operation in liquid or ambient temperatures of up to 104°F. (40°C.). Operational restrictions at temperatures below 104°F are not acceptable. Fans, blowers, or auxiliary cooling systems that are mounted external to the pump motor are not acceptable
- D. **Cable Entry Seal:** The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal.
- E. **Motor:** The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The motor shall be designed for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. The motor and the pump shall be produced by the same manufacturer.

SUBMERSIBLE PUMP SYSTEM

11.2 - 4

The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.

The motor construction shall be of explosion proof, TENV-TEXP design and capable of being certified for use in Class 1, Groups C & D hazardous locations by either Factory Mutual (F.M.) or Underwriters Laboratories (U.L).

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

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

- F. Bearings: The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces. Single row lower bearings are not acceptable. The minimum L₁₀ bearing life shall be 50,000 hours at any usable portion of the pump curve.
- G. Mechanical Seal: Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide seal ring.

Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available.

The following seal types shall not be considered acceptable or equal to the dual independent seal specified: shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower

seal faces. No system requiring a pressure differential to offset pressure and to effect sealing shall be used.

Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. The motor shall be able to operate dry without damage while pumping under load.

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

Seal lubricant shall be FDA Approved, nontoxic.

- H. Pump Shaft: Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The pump shaft shall be stainless steel – ASTM A479 S43100-T.

If a shaft material of lower quality than stainless steel – ASTM A479 S43100-T is used, a shaft sleeve of stainless steel – ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided in the oil housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

- I. Impeller: The impeller and the cutter insert ring shall be wear resistant against sand and grit which is expected to enter the pump station with the sewage or the storm water. They shall be made of ASTM A-532 Alloy III A with 25% chrome (hard-iron). The impeller shall be capable of handling solids, fibrous materials, heavy sludge and other matter found in normal sewage applications. Fibers are caught by the cutter grooves and sheared between the hardened edges of the impeller and the hard iron cutter plate.

Impellers that have surface hardening or coating will not be allowed.

The fit between the impeller and the shaft shall be a sliding fit with a taper-lock bushing pressed by a screw which is threaded into the end of the shaft.

- J. Volute: Pump volute(s) shall be single-piece grey cast iron, Class 35B, non-concentric design with smooth passages large enough to pass any solids that may enter the impeller. Minimum inlet and discharge size shall be as specified.
- K. Protection: All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. At 125°C (260°F) the thermal switches shall open, stop the motor and activate an alarm.
- L. Moisture Detection

Moisture detection shall be provided conforming to either of the following descriptions based on pump manufacturer's standard:

1. Two moisture detection probes shall be installed so that they will detect moisture in either the seal or stator cavity measuring resistivity between the probes. They shall be wired internally to the control cable connection at the top of the motor. O-ring sealed inspection plugs shall be provided in the mechanical seal oil chamber for ease in inspection, draining, and filling of oil.
2. A leakage sensor shall be provided to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will stop the motor and send an alarm both local and/or remote. The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS shall be designed to be mounted in any control panel.

- M. Cable Entry System: The power and control cable entry system shall be designed to provide a positive, leak-free seal to prevent liquid from entering the air filled motor housing. The design shall incorporate provisions which prevent moisture from wicking through the cable assembly even in the event that the cable jacket has been punctured. All cable shall be type SEOW-A and U.L. listed for the intended submersible service.

The power and control cable entry into the lead connection chamber shall be encapsulated for positive moisture sealing. A Buna-N cable grommet shall be provided in addition to the epoxy sealed leads. Compression type grommet fittings employed as the primary sealing system shall neither be considered equal or acceptable. Separate power and control cables shall be provided to prevent false sensor warnings.

- N. Guide Bracket & Rail System: The pump shall be provided with a 316 SS guide system to allow easy removal without entering the wet well. The main base fixture shall be bolted to the floor and shall include a 90 degree Cast Iron elbow and mounts for two 316 SS rails of standard schedule 40 pipe. The base fixture shall be designed to receive the connecting pump slide bracket without the need for bolts, nuts, or clamps. The pump discharge will connect to a Cast Iron slide bracket with bronze guide shoe for non-sparking design that seals against the base fixture by the weight of the pump.
- O. Pressure Gauge: A discharge pressure gauge shall be installed on the common discharge header for start-up and pump performance testing. Provide a 316SS, 3" minimum face size, liquid filled gauge in a scale appropriate for the pumping system. Gauges shall be Ashcroft or approved equal.

2.2 CONTROL SYSTEM

- A. Electrical power to be furnished to the site will be 3 phase, 60 Hertz, 480

volts.

B. *The control circuitry shall be designed to operate on 115 +/-10% volts, 60 Hertz, single phase current, and control two (2) pumps driven by 15 H.P. motors at 1765 RPM. The control assembly shall provide means to operate each pump manually or automatically. When operated in the automatic mode, the control assembly shall provide means to automatically alternate the position of the "lead" pump after each pumping cycle.*

C. PANEL ENCLOSURE

1. The complete control assembly shall be contained in one NEMA 4X stainless steel enclosure.
2. *All seams shall be free of burrs and free of open voids to prevent leakage. The enclosure shall be constructed in conformance with applicable sections of the National Electrical Manufacturer's Association (NEMA).*
3. The enclosure shall be equipped with a removable inner swing panel fabricated of steel, mounted on lift off hinges. The inner swing panel shall be of adequate size to completely cover all wiring and components mounted on the back panel and shall make provision for the mounting of all basic and optional controls and instruments. The inner swing panel shall have a minimum horizontal swing of 90o and shall be held in the closed position with straight slot screws.
4. The door shall be mounted on a continuous (piano-type), vertical, steel hinge, sealed around its entire perimeter and held in the closed position with a three pad-lockable draw pull latches. The door shall have a minimum horizontal swing of 165o.
5. The enclosure shall be furnished with a removable back panel fabricated of steel, secured to the enclosure on collar studs. The back panel shall be of adequate size to accommodate all basic and optional components.
6. There shall be no holes in the enclosure for mounting the enclosure or mounting within the enclosure.
7. All control wiring shall conform to the National Electric Code. Wires connected to components mounted on the enclosure door shall be bundled and tied in accordance with good commercial practice. Bundles shall be made flexible at the hinged side of the enclosure. Adequate length and flex shall be provided to allow the door to swing to its full open position without undue stress or abrasion on the wire or insulation. Bundles shall be held in place on each side of the hinge by mechanical fastening devices.
8. The motor control shall be completely wired at the factory, except for the power feeder lines, in accordance with applicable wiring standards set forth by the National Electric Code (NEC).

9. All components shall be electrically grounded to a common ground lug mounted on the control panel sub plate. Upon installation of lift station, and before connection of any power feeder lines, contractor shall extend grounding wire from lug to external ground in accordance with local electrical code.

D. COMPONENTS

1. All major components shall be securely fastened to the removable back panel with screws.
2. VFD sizing shall be based on 125% of actual motor full load rated amps, not solely based on a published horsepower (HP) rating.
3. *VFD's shall be provided with integral bypass "across the line" starters with associated motor circuit protector, separate thermal overload protection, and mechanical / electrical interlocks to prevent simultaneous operation of the VFD and bypass mode.*
4. *VFD's installed external to the Control Panel shall have individual 316SS NEMA 3R cabinets.*
5. A properly sized thermal-magnetic air circuit breaker shall be furnished for each submersible pump motor, and shall have a symmetrical rms interrupting rating of 14,000 amperes at 460 volts. All circuit breakers shall be sealed by the manufacturer after calibration to prevent tampering. A mechanical disconnect mechanism shall be installed on each circuit breaker to provide a means of disconnecting power to the pump motors. Operator handles for the disconnect mechanisms shall be located on the exterior of the inner swing panel with interlocks which permit the swing panel to be opened only when the circuit breakers are in the "OFF" position.
6. Pump motors shall be provided with variable frequency drives as outlined below:
 - a. This specification is to cover a complete Variable Frequency motor Drive (VFD) consisting of a pulse width modulated (PWM) inverter designed for use on a standard NEMA induction motor. Variable Frequency Drive shall be ABB, Square d Altivar or equal.
 - b. The VFD package as specified herein shall be UL listed as a complete assembly and enclosed in an integrated UL type 1 enclosure, assembled and tested by the manufacturer in an ISO9001 facility. The VFD tolerated voltage window shall allow the VFD to operate from a line of +30% nominal, and -35% nominal voltage as a minimum.

SUBMERSIBLE PUMP SYSTEM

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- c. All VFDs shall have the same customer interface, including digital display, and keypad, regardless of horsepower rating. The keypad shall be removable, capable of remote mounting and allow for uploading and downloading of parameter settings as an aid for start-up of multiple VFDs.

The keypad shall include Hand-Off Auto selections and manual speed control. The drive shall incorporate bumpless transfer of speed reference when switching between Hand and Auto modes.

- d. The VFD shall have the ability to automatically restart after an over-current, over-voltage, under-voltage, or loss of input signal protective trip. The number of restart attempts, trial time, and time between attempts shall be programmable.

The overloading rating of the drive shall be 110% of its normal duty current rating for one (1) minute every ten (10) minutes, 130% overload for two (2) seconds. The minimum FLA rating shall meet or exceed the values in the NEC/UL table 430-150 for 4-pole motors.

- e. The VFD shall have an integral 5% impedance line reactors to reduce the harmonics to the power line and to add protection from AC line transients. The 5% impedance may be from dual (positive and negative DC buss) reactors, or 5% AC line reactors. VFDs with only one DC reactor shall add AC line reactors.
- f. The VFD shall include a coordinated AC transient protection system consisting of 4-120 joule rated MOVs (phase to phase and phase to ground), a capacitor clamp, and 5% impedance reactors.
- g. The VFD shall be capable of sensing a loss of load (broken belt/broken coupling) and signal the loss of load condition. Relay outputs shall include programmable time displays that will allow for drive acceleration from zero speed without signaling a false underload condition.
- h. If the input reference (4-20mA or 2-10V) is lost, the VFD shall give the user the option of either (1) stopping and displaying a fault, (2) running at a programmable preset speed, (3) hold the VFD speed based on the last good reference received, or (4) cause a warning to be issued, as selected by the user.
- i. The VFD shall have programmable Sleep and Wake up functions to allow the drive to be started and stopped from the level of process feedback signal.

- j. All VFD to have the following adjustments:
1. Three (3) programmable critical frequency lockout ranges to prevent the VFD from operating the load continuously at an unstable speed.
 2. Two (2) PID Setpoint controllers shall be standard in the drive, allowing pressure or flow signals to be connected to the VFD, using the microprocessor in the VFD for the closed loop control.
 3. Two (2) programmable analog inputs shall accept current or voltage signals.
 4. Two (2) programmable analog outputs (0-20mA or 4-20mA).
 5. Six (6) programmable digital inputs for maximum flexibility in interfacing with external devices.
 6. Three (3) programmable digital Form-C relay outputs.
 7. Seven (7) programmable preset speeds.
 8. Two (2) independently adjustable accel and decel ramps with 1 - 1800 seconds adjustable time ramps.
 9. The VFD shall include a motor flux optimization circuit that will automatically reduce applied motor voltage to the motor to optimize energy consumption and audible motor noise.
 10. The VFD shall include a carrier frequency control circuit that reduces the carrier frequency based on actual VFD temperature that allows the highest carrier frequency without derating the VFD or operating at high carrier frequency only at low speeds.
 11. The VFD shall include password protection against parameter changes.
- k. The Keypad shall include a backlit LCD display. The display shall be in complete English words for programming and fault diagnostics (alpha-numeric codes are not acceptable). All applicable operating values shall be capable of being displayed in

SUBMERSIBLE PUMP SYSTEM

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engineering (user) units. A minimum of three operating values shall be capable of being displayed at all times.

1. All VFDs shall include EMI/RFI filters. The onboard filters shall allow the VFD assemble to be CE Marked and the VFD shall meet product standard EN 61800-3 for the First Environment restricted level.
7. A padlocking operating mechanism shall be installed on each motor circuit breaker. Operator handles for the mechanism shall be located on the exterior of the control compartment door, with interlocks which permit the door to be opened only when the circuit breakers are in the "off" position.
8. Overload relays shall be of block-type, utilizing melting alloy type spindles, and shall have visual trip indication with trip-free operation. Pressing of the overload reset lever shall not actuate the control contact until such time as the overload spindle has reset. Resetting of the overload reset lever will cause a snap-action control contact to reset, thus reestablishing a control circuit. Overload relays shall be manually reset only and not convertible to automatic reset. Trip setting shall be determined by heater element only and not by adjustable overload relays. An overload reset pushbutton shall be mounted through the door of the motor control center and permit resetting of the motor overload relays without opening the control panel door.
9. A switch shall be provided to permit the station operator to select automatic alternation of the pumps, to select pump number one to be the lead pump for each pumping cycle or to select pump number two to be the lead pump for each pumping cycle. Selector switch shall be standard duty, rated NEMA 4X, with contacts rated NEMA A600 minimum.
10. Pump mode selector switches shall be connected to permit manual start and manual stop for each pump individually, and to select automatic operation of each pump under control of the liquid level control system. Manual operation shall override the liquid level control system. Selector switch shall be standard duty, rated NEMA 4X, with contacts rated NEMA A600 minimum.
11. A pump alternation shall be provided by the use of a PLC, Allen-Bradley CompactLogix. Pump alternator shall operate after pump shutdown.
12. ***Control panel shall be equipped with one standard duty, rated NEMA 4X, pilot light for each pump motor. Light shall be wired in parallel with the related pump motor starter (or VFD) to indicate that the motor is on. Run lights shall be equipped with lamps providing a minimum of 15,000 hours.***
13. ***The pump control panel shall be equipped to terminate pump***

operation due to high motor winding temperature or moisture in the motor housing and shall utilize the contacts in the pump motor. If either event should occur, the motor starter (or VFD) will drop out and a mechanical indicator, visible on the inner door, shall indicate the pump motor has been shutdown. The pump motor shall remain locked out until the condition has been corrected and manually reset. Control panel shall be equipped with one standard duty, NEMA 4X pilot light for each pump motor to indicate a pump fail condition.

14. Six digit elapsed time indicators (non-reset type) shall be connected to each VFD to indicate the total running time of each pump in "hours" and "tenth of hours".
15. The motor control center shall be equipped with a duplex grounding receptacle located on the exterior of the enclosure in weatherproof box. The receptacle circuit shall be protected by a 15 ampere thermal magnetic circuit breaker.
16. Lift station manufacturer shall furnish 115 Volt, A.C. 40-watt, vapor-tight alarm light with red globe, guard and mounting hardware. The contractor shall mount, wire and run conduit to the light as shown on the plans. Wiring shall be connected to the appropriate terminal blocks in the motor control center as shown on the lift station wiring schematic.
17. The control panel shall be equipped to monitor the incoming power and shut down the pump when required to protect the motors from damage caused by phase reversal, phase loss, voltage unbalance greater than 5% or voltage less than 83% of nominal. A time delay shall be provided to minimize nuisance trips. The motors shall automatically restart when power conditions return to normal. Control panel shall be equipped with a standard duty, NEMA 4X pilot light to indicate power failure.
18. The control circuit shall contain a pump delay circuit to prevent both pumps from simultaneous starting following a power failure.
19. An alarm silence switch and relay shall be provided to permit maintenance personnel to de-energize the external alarm device while corrective actions are underway. After silencing the alarm device, manual reset of the signal relay shall provide automatic reset of the alarm silence relay.
20. An 12" Performance Conformally Coated, operator interface terminal shall be provided for local monitoring and control, Allen-Bradley PanelView, Model 2711P-T12W22D9PK, or approved equal.
21. The following parameters shall be outputs to telemetry:
 - Power fail
 - Control fail
 - Dry well high

- Wet well high
- Influent vault high (if applicable)
- Security alarm
- Pump fail for each pump:
- Seal fail
- High temp
- Check valve fail to open
- Generator exercise
- Generator running
- Generator fail
- Grinder fail

E. LEVEL CONTROL SYSTEM

1. The level control system shall start, adjust pump speed and stop the pump motors in response to changes in wet well levels, as set forth herein.
2. The primary level control sensor shall A multi-stage level sensing device (Level Sensing Probe) designed to detect liquid level at specified intervals in tanks or sumps and interface with an electronic controller for pump control and liquid level display. Rising and falling liquid level in the wet well causes capacitive switches within the probe to open and close, providing level signals for the level control components. Probes shall be manufactured by Flygt, FOGRod, or equal.
3. A secondary level control system shall be installed using a submerged liquid level pressure transducer manufactured by Flygt, Siemens, or approved equal.
4. The level control system shall allow for manual selection of the primary or secondary level sensors and should revert to the other in event of failure of either sensor.
5. The level control system use a PLC based PID controller to vary pump speed from the minimum speed to the maximum speed (as set in the VFD) across the operating range as show on the drawings as "Pump On" to "Pump Off". When the liquid is lowered to the "Pump Off", the system shall stop this pump. These actions shall constitute one pumping cycle. **Pumps shall be interlocked to not allow simultaneous operation in Automatic mode.** Should the wet well level rise above to the "Wet Well High" level an alarm shall be initiated. Should either the lead pump or both fail to start, a pump fail alarm shall be initiated and the control system shall alternate to the Lag pump.
6. The level control system shall utilize the pump alternator to select first one pump, then the second pump to run as lead pump for a pumping cycle. Alternation shall occur at the end of a pumping cycle.
7. Pump station manufacturer shall furnish separate float switch

assemblies, signal relays, for high water alarm, dry well high and influent vault high (if applicable) functions. Should the levels rise to the alarm level, the float switch assembly and relay shall energize the signal relay. The signal relay shall complete a 115-volt AC circuit for an external alarm device. A standard duty, NEMA 4X pilot light mounted in the control panel shall indicate that a high level exists.

G. ANCILLARY EQUIPMENT:

The control system shall include, but not be limited to, the equipment listed below.

1. A green Square-D 30 mm L.E.D. run pilot indicator shall be mounted on the door.
2. An elapsed time meter (Crammer 635 E&S) shall be mounted on the dead front door. The meter shall operate on 120 vac, shall indicate in hours [6 digits] and tenths and shall be non-resettable.
3. A float back up circuit shall be provided utilizing a wide angle float and intrinsic relay with time delays and indication that circuit is active via a green Square-D 30 mm L.E.D. indicator.
4. A green Square-D 30 mm L.E.D. pump running indicator pilot light for each pump.

H. MISCELLANEOUS

1. A final as built drawing encapsulated in mylar shall be attached to the inside of the front door. A list of all legends shall be included.
2. All component parts in the control panel shall be permanently marked and identified as they are indicated on the drawing. Marking shall be on the back plate adjacent to the component. All control conductors shall be identified with wire markers at each end as close as practical to the end of conductor with white heat shrink sleeves and black numbers
3. All panels shall be tested to the power requirements as shown on the plans to assure proper operation of all the components. Each control function shall be activated to check for proper indication.
4. All control equipment shall be guaranteed for a period of three [3] years minimum from date of shipment. The guarantee is effective against all defects in workmanship and /or defective component. The warranty is limited to replacement or repair of the defective equipment unless noted otherwise with additional requirements.

6. Control system components, Pump VFDs, motor starters and other major equipment shall be tested fully and all operational functionality confirmed before shipped to the project site. All field devices shall be simulated in this functional test before the control panel is delivered to the project site.
7. The control system supplier shall be required to be on site to commission the panel, make setting changes, make corrections and address problems found during commissioning of equipment.

PART 3 - EXECUTION

3.1 INSTALLATION

Equipment shall be installed in accordance with the supplier's installation instructions, and in compliance with all OSHA, local, state, and federal codes and regulations.

3.2 MANUFACTURER'S SERVICES

- A. The Contractor shall require the manufacturer to furnish the services of a qualified field engineer to perform the following functions in the designed periods of time. These services are to be performed at the jobsite. A minimum of two (2) visits to the job site shall be required. A one week notice to the Owner and Engineer shall be provided for activities defined in section 3.2 Manufacture's Services.
 1. Check-out of installation, start-up of equipment and initial operator instruction. This service shall take place after all mechanical equipment associated with the control system is installed and mechanically operable.
 2. After equipment is fully operational, and before Owner will assume responsibility for the operation of the equipment, the equipment manufacturer's representative shall instruct the Owner's operating personnel in the care, maintenance and proper operation of the equipment. Contractor shall submit Manufacture inspection and certification of proper installation including all data checked noting all initial details verified by Manufacture and initial set point established. Start up and certification of proper installation shall be included and submitted with the O&M
 3. Provide Operation and Maintenance training. Training time required shall be in addition to time required for start-up activities noted above. Training should include a minimum of two (2) hour

of field training and class room training, as required to provide sufficient Manufacture's recommended training.

B. Field Test

1. Prior to equipment startup, all equipment described herein shall be inspected for quiet operation, proper connections, and satisfactory performance by means of a functional test.
2. The pump and motor assembly shall be field tested to verify vibration is not in excess of the limits stated in the latest revision of Hydraulic Institute and NEMA MG 1.
3. The pump, motor, and controls shall be given an operational test in accordance with the standards of the Hydraulic Institute. Recordings of the test shall substantiate the correct performance of the equipment at the design head, capacity, speed and horsepower as specified herein. When a lift station effluent flow meter is not installed Contractor shall perform a wet well drawdown test to establish pump capacity.
4. Units apparently failing to meet the Specifications to the satisfaction of the Engineer must be more accurately tested in accordance with Hydraulic Institute Standards. If the pump fails the second test, the unit will be rejected, and the Contractor shall furnish a unit that will perform as specified.

C. Operation and Maintenance Materials

1. The pump manufacturer shall be responsible for supplying written instructions, which shall be sufficiently comprehensive to enable the operator to operate and maintain the pump and all equipment supplied by the manufacturer. Instructions shall assume that the operator is familiar with pumps, motors, piping, valves, and controls, but that he has not previously operated and/or maintained the exact equipment supplied.
2. The instructions shall be prepared as a system manual applicable solely to the pump and equipment supplied by the manufacturer to these specifications, and shall include those devices and equipment supplied by him.
3. Operation and maintenance instructions shall be specific to the equipment supplied in accordance with these specifications. Instruction manuals applicable to many different configurations and pumps, and which require the operator to selectively read portions

SUBMERSIBLE PUMP SYSTEM

11.2 - 17

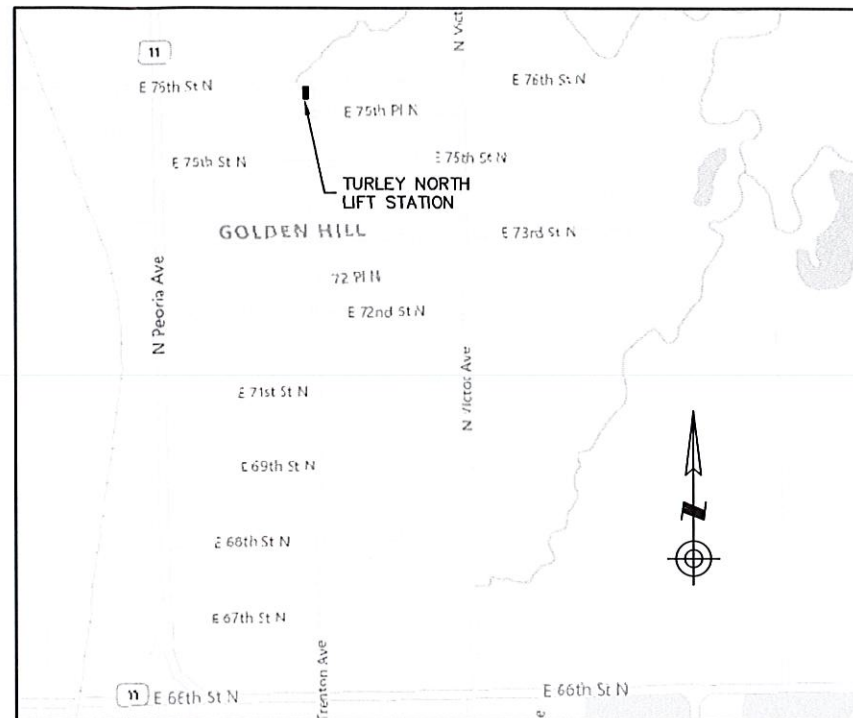
of the instructions shall not be acceptable. To clarify these types of manuals mark through all information not applicable to equipment supplied.

4. Provide five (5) hard copies and 1 PDF version of the final O&Ms.
- D. All costs for the above manufacturer functions including travel, lodging, meals, and incidentals shall be considered to have been included in the Contractor's lump sum bid price.

END OF SECTION

SUMMARY OF PAY ITEMS - LIFT STATION AND FORCEMAIN

ITEM NUMBER	SPEC NUMBER	ITEM DESCRIPTION	PAY NOTES	UNIT	QUANTITY
1	201(A)	CLEARING AND GRUBBING	4	EA	1
2	220	SWPPP	10	EA	1
3	221(C)	TEMPORARY SILT FENCE		LF	442
4	230(A)	SOLID SLAB SODDING	7	SY	178
5	303(A)	AGGREGATE BASE TYPE 'A'		CY	175
6	306	18 INCH REINFORCED CONCRETE PIPE		LF	75
7	310(B)	SUBGRADE METHOD 'B' - 6 INCHES		SY	751
8	312	6 INCH DIP - WYE, RJ	3	EA	1
9	312	6 INCH DIP - SLEEVE, RJ	3	EA	1
10	317	6 INCH PLUG VALVE	3	EA	1
11	312	6 INCH 45 DEGREE BEND, RJ	3	EA	2
12	325	SEPARATOR FABRIC		SY	532
13	335	CONTRACTOR QUALITY CONTROL		LSUM	1
14	335	CONTRACTOR AS-BUILT		EA	1
15	405	6 INCH PVC C900 DR18	5	LF	66
16	405	12 INCH PVC - SDR 35 OPEN CUT	5	LF	48
17	414(A)	P.C. CONCRETE PAVEMENT (PLACEMENT)		SY	700
18	414(B)	P.C. CONCRETE PAVEMENT - REINFORCED		CY	136
19	509(B)	CLASS 'A' CONCRETE		CY	141
20	611(A)	4 FOOT PRECAST MANHOLE, COMPLETE	8	EA	1
21	611(A)	VERTICAL FOOT OF MANHOLE DEPTH OVER 6 FEET		VF	6
22	613(M)	CULVERT END TREATMENT		EA	4
23	624	SECURITY FENCING AND GATES		LF	320
24	641	MOBILIZATION		EA	1
25	642	CONSTRUCTION STAKING	1	EA	1
26	COT 702	CONCRETE DRIVEWAY		SY	250
27	SPECIAL	TURLEY NORTH LIFT STATION IMPROVEMENTS	9,11,12	EA	1
28	SPECIAL	TURLEY NORTH LIFT STATION DEMOLITION	2	EA	1
29	SPECIAL	OWNER'S ALLOWANCE	6	ALLOW	100,000
ADDITIVE ALTERNATE NO. 1					
30	SPECIAL	ADDITIONAL LIFT STATION PUMP, NOT INSTALLED		EA	1
ADDITIVE ALTERNATE NO. 2					
31	611(A)	4 FOOT PRECAST MANHOLE, COMPLETE	8,13	EA	1



1 TURLEY NORTH LIFT STATION
2 NTS

PAY ITEM NOTES – LIFT STATION REHABILITATION:

- INCLUDES THE COST OF ALL SURVEYING AND STAKING NECESSARY TO COMPLETE THE ENTIRE PROJECT. WORK SHALL BE PERFORMED BY AN OKLAHOMA REGISTERED LAND SURVEYOR.
- INCLUDES DEMOLITION OF EXISTING LIFT STATION AND SITE RESTORATION. SEE DEMOLITION PLAN SHEETS FOR ADDITIONAL REQUIREMENTS.
- ALL SANITARY SEWER DUCTILE IRON PIPE AND FITTINGS 6 INCHES DIAMETER AND LARGER SHALL BE PROTECTED 401 LINED.
- INCLUDES RIGHT-OF-WAY CLEARING AND RESTORATION FOR GRAVITY SEWER AND FORCE MAIN. EXISTING FENCES DISTURBED DUE TO CONSTRUCTION SHALL BE REPLACED WITH NEW MATERIALS AND SHALL BE INCLUDED IN THE COST FOR RIGHT-OF-WAY CLEARING AND RESTORATION FOR LINES 4-INCH DIAMETER AND LARGER. NO ADDITIONAL PAYMENT SHALL BE MADE.
- INCLUDES ALL COSTS FOR UNCLASSIFIED EXCAVATION AND BACKFILL FOR THE PROPOSED GRAVITY SEWER AND FORCE MAIN. THIS ITEM INCLUDES PAYMENT FOR COMPACTED CLASS A AGGREGATE BACKFILL WHERE REQUIRED UNDER PAVEMENT IN ACCORDANCE WITH STANDARD SPECIFICATION 302. THIS ITEM DOES NOT INCLUDE COSTS FOR LIFT STATION DEMOLITION. BLASTING WILL NOT BE PERMITTED. ALL BACKFILL SHALL BE COMPACTED TO 95% STANDARD DENSITY UNLESS NOTED SPECIFICALLY OTHERWISE.
- REFER TO SPECIFICATION SECTION SP1.1 – ALLOWANCE FOR REQUIREMENTS.
- PAYMENT OF SOD IS BASED ON THE LIMITS OF CITY LS SITE EASEMENT AND UTILITY EASEMENT. OTHER DISTURBED AREAS ARE NOT INCLUDED IN THESE QUANTITIES.
- ALL MANHOLES SHALL BE COMPLETE IN PLACE. THIS PAY ITEM INCLUDES FRAME, COVER, CONCRETE AND ALL OTHER INCIDENTALS REQUIRED FOR PLACEMENT. MANHOLES SHALL HAVE LOCKING LID.
- THIS ITEM INCLUDES ALL IMPROVEMENTS INCLUDING CONSTRUCTION OF THE PROPOSED TURLEY NORTH LIFT STATION, ELECTRICAL IMPROVEMENTS, BACK UP GENERATOR AND ALL APPURTENANCES.
- ITEM INCLUDES ALL COSTS FOR PREPARATION AND APPROVAL OF SWPPP AS COMPLETED AND COORDINATED BY CONTRACTOR IN ACCORDANCE WITH CONSTRUCTION DOCUMENTS.
- INCLUDES ALL COSTS ASSOCIATED WITH THE CONSTRUCTION OF THE PROPOSED ELECTRICAL INFRASTRUCTURE.
- CONTRACTOR SHALL INCLUDE ALL COSTS TO FULLY COMPLY WITH APPLICABLE REQUIREMENTS OF THE DIVISION 7 – WATER AND SEWER DEPARTMENT STANDARDS INCLUDING:
A. 701 – SPECIAL REQUIREMENTS, 702 – PREFERRED MANUFACTURERS AND NEW EQUIPMENT PURCHASES:
<https://www.cityoftulsa.org/media/2405/water-sewer-guidelines-701-and-702.pdf>
B. 730 – SCADA STANDARDS:
<https://www.cityoftulsa.org/government/departments/public-works/engineering-services/specifications-checklists-and-details-8x11/730-scada-standards/>
- PAY ITEM SHALL INCLUDE ALL COSTS ASSOCIATED WITH REPLACING THE TIE-IN MANHOLE, INCLUDING BUT NOT LIMITED TO BYPASS PUMPING REQUIRED.



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LOCATION MAP & QUANTITIES SUMMARY	
TMUA PROJECT NUMBER ES 2022-10	
CITYWIDE LIFT STATION IMPROVEMENTS	
CITY OF TULSA, OKLAHOMA WATER AND SEWER DEPARTMENT	

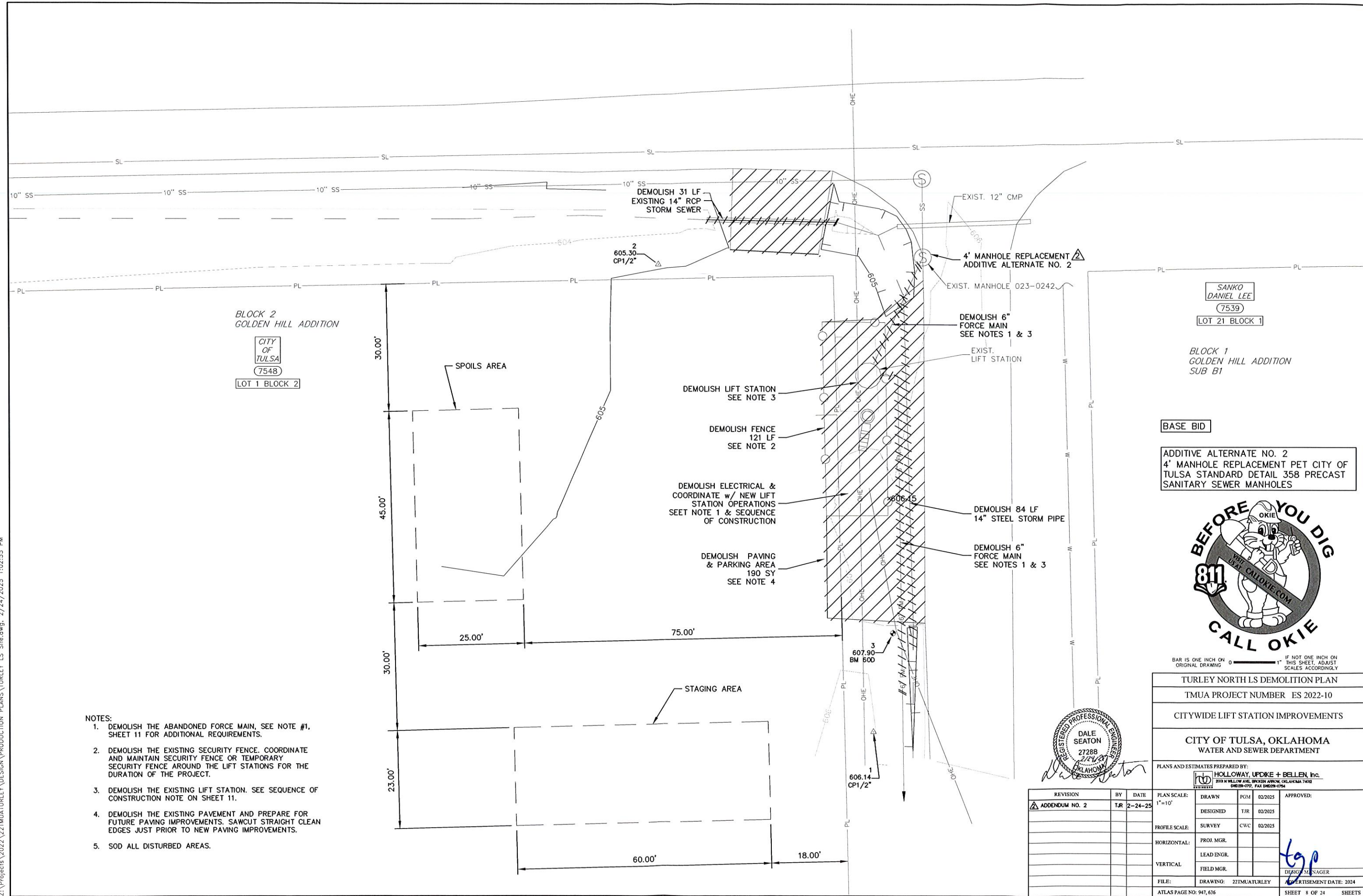


PLANS AND ESTIMATES PREPARED BY:
HOLLOWAY, UPDIKE + BELLEN, Inc.
200 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012
58028-0701, FAX 58028-0704

REVISION	BY	DATE	PLAN SCALE:	DRAWN	PGM	DATE	APPROVED:
ADDENDUM NO. 2	TJR	2-24-25		DESIGNED	TJR	06/2024	<i>tgp</i> DESIGN MANAGER
			PROFILE SCALE:	SURVEY	CWC	06/2024	
			HORIZONTAL:	PROJ. MGR.			
			VERTICAL:	LEAD ENGR.			
				FIELD MGR.			
			FILE:	DRAWING:	22TMUATURLEY	ADVERTISEMENT DATE:	2024
			ATLAS PAGE NO:	947, 636			SHEET 2 OF 24 SHEETS

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- NOTES:**
1. DEMOLISH THE ABANDONED FORCE MAIN, SEE NOTE #1, SHEET 11 FOR ADDITIONAL REQUIREMENTS.
 2. DEMOLISH THE EXISTING SECURITY FENCE. COORDINATE AND MAINTAIN SECURITY FENCE OR TEMPORARY SECURITY FENCE AROUND THE LIFT STATIONS FOR THE DURATION OF THE PROJECT.
 3. DEMOLISH THE EXISTING LIFT STATION. SEE SEQUENCE OF CONSTRUCTION NOTE ON SHEET 11.
 4. DEMOLISH THE EXISTING PAVEMENT AND PREPARE FOR FUTURE PAVING IMPROVEMENTS. SAWCUT STRAIGHT CLEAN EDGES JUST PRIOR TO NEW PAVING IMPROVEMENTS.
 5. SOD ALL DISTURBED AREAS.

SANKO DANIEL LEE
(7539)
LOT 21 BLOCK 1

BLOCK 1
GOLDEN HILL ADDITION
SUB B1

BASE BID

ADDITIVE ALTERNATE NO. 2
4' MANHOLE REPLACEMENT PET CITY OF TULSA STANDARD DETAIL 358 PRECAST SANITARY SEWER MANHOLES




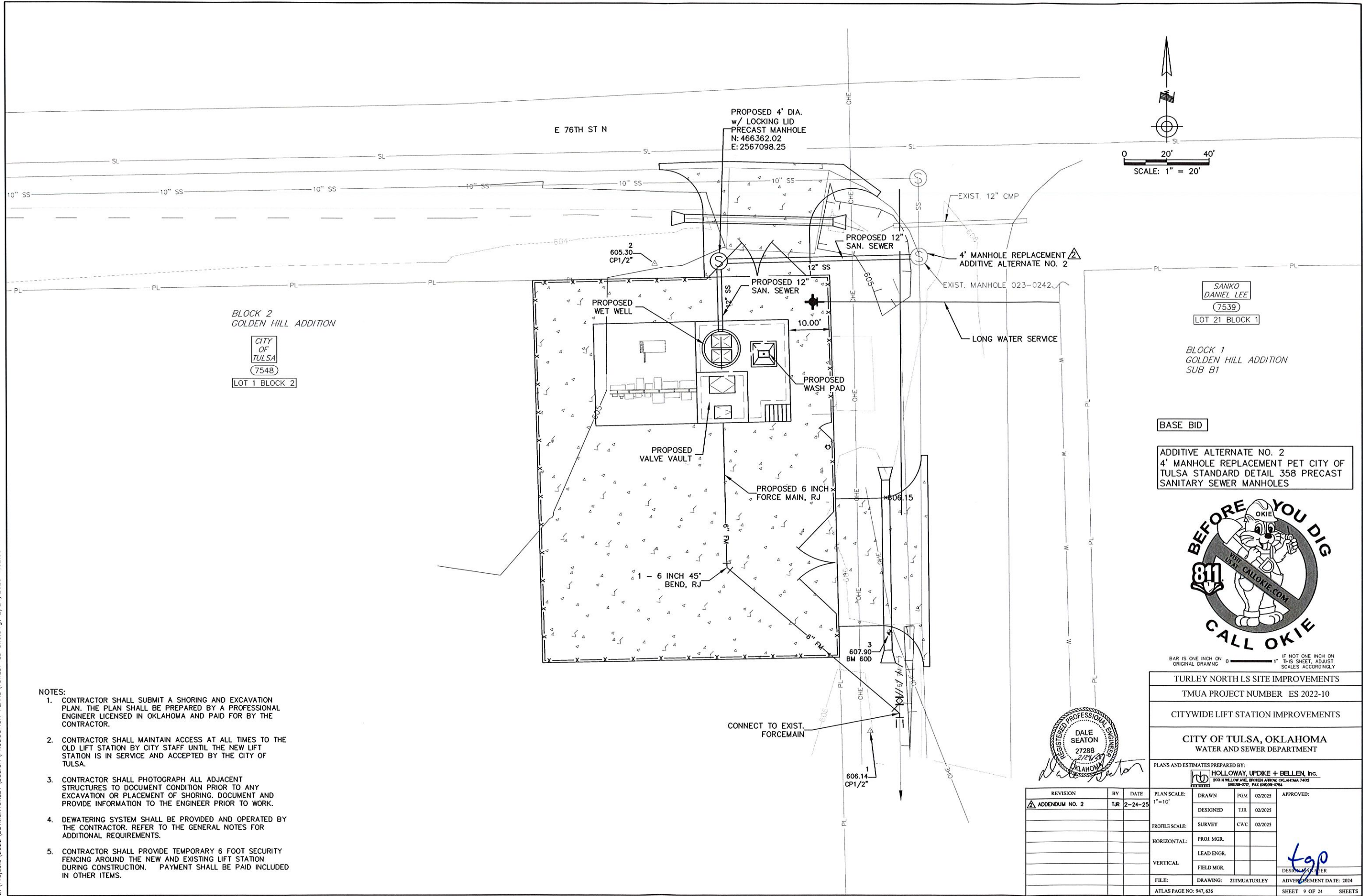
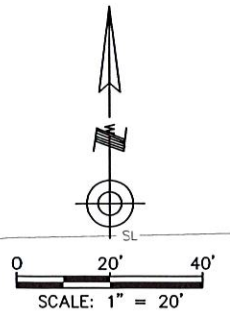
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TURLEY NORTH LS DEMOLITION PLAN
TMUA PROJECT NUMBER ES 2022-10
CITYWIDE LIFT STATION IMPROVEMENTS
CITY OF TULSA, OKLAHOMA
WATER AND SEWER DEPARTMENT



PLANS AND ESTIMATES PREPARED BY:
HOLLOWAY, UPDIKE + BELLEN, Inc.
200 N. MILLCREEK AVE., BROOKSHIRE, OKLAHOMA 74020
918-228-0700, FAX 918-228-0754

REVISION	BY	DATE	PLAN SCALE:	DRAWN	PGM	DATE	APPROVED:
ADDENDUM NO. 2	TJR	2-24-25	1"=10'	DESIGNED	TJR	02/2025	 DALE SEATON REGISTERED PROFESSIONAL ENGINEER NO. 27288 STATE OF OKLAHOMA
			PROFILE SCALE:	SURVEY	CWC	02/2025	
			HORIZONTAL:	PROJ. MGR.			
			VERTICAL:	LEAD ENGR.			
				FIELD MGR.			
			FILE:	DRAWING:	22TMUATURLEY	ADVERTISEMENT DATE:	2024
			ATLAS PAGE NO:	947, 636			SHEET 8 OF 24 SHEETS



BLOCK 2
GOLDEN HILL ADDITION

CITY OF
TULSA
7548

LOT 1 BLOCK 2

SANKO
DANIEL LEE
(7539)

LOT 21 BLOCK 1

BLOCK 1
GOLDEN HILL ADDITION
SUB B1

BASE BID

ADDITIVE ALTERNATE NO. 2
4' MANHOLE REPLACEMENT PET CITY OF
TULSA STANDARD DETAIL 358 PRECAST
SANITARY SEWER MANHOLES




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TURLEY NORTH LS SITE IMPROVEMENTS
TMUA PROJECT NUMBER ES 2022-10
CITYWIDE LIFT STATION IMPROVEMENTS
CITY OF TULSA, OKLAHOMA
WATER AND SEWER DEPARTMENT

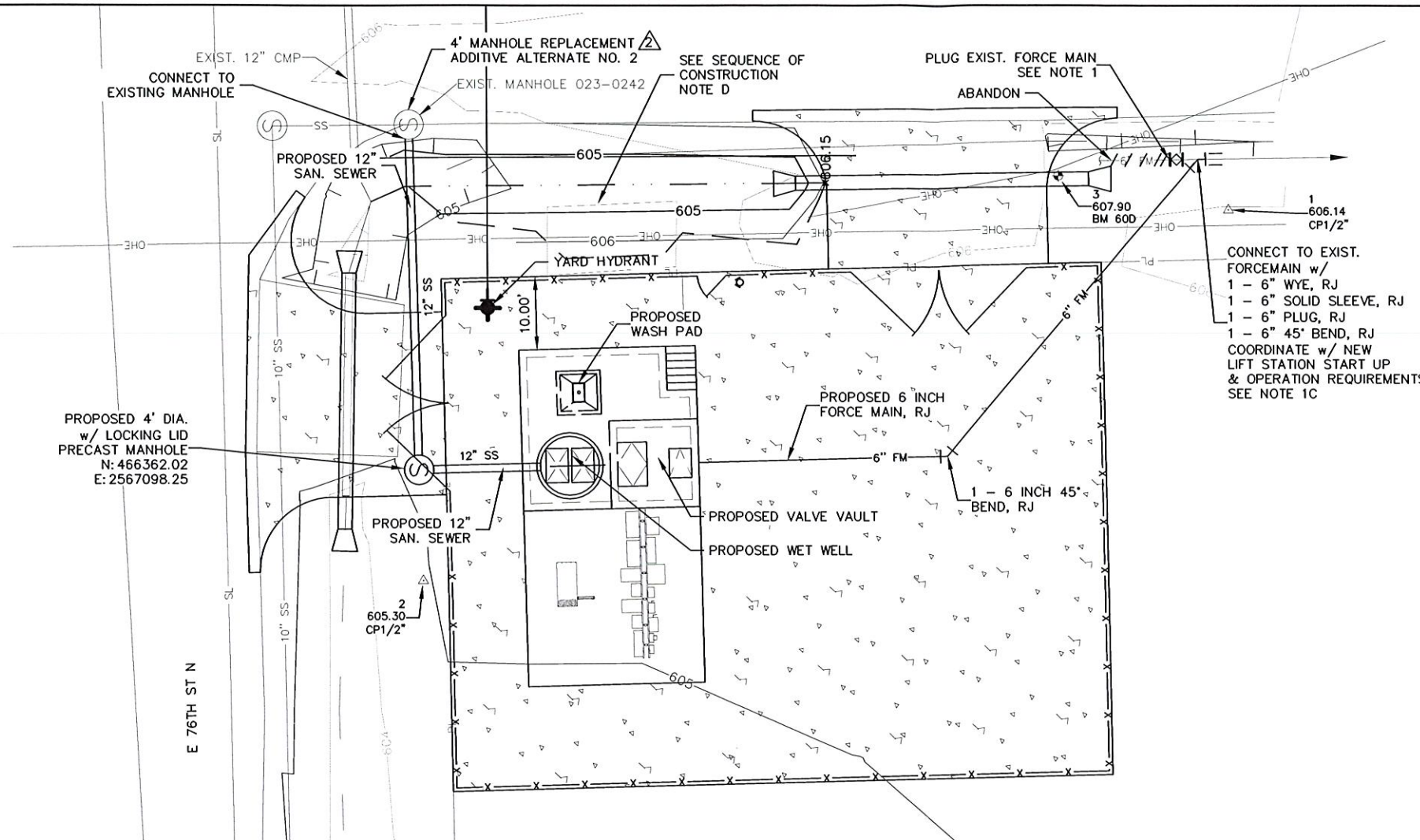
PLANS AND ESTIMATES PREPARED BY:
HOLLOWAY, UPDIKE + BELLEN, Inc.
2008 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74002
(918) 258-0770, FAX (918) 258-0754



- NOTES:
1. CONTRACTOR SHALL SUBMIT A SHORING AND EXCAVATION PLAN. THE PLAN SHALL BE PREPARED BY A PROFESSIONAL ENGINEER LICENSED IN OKLAHOMA AND PAID FOR BY THE CONTRACTOR.
 2. CONTRACTOR SHALL MAINTAIN ACCESS AT ALL TIMES TO THE OLD LIFT STATION BY CITY STAFF UNTIL THE NEW LIFT STATION IS IN SERVICE AND ACCEPTED BY THE CITY OF TULSA.
 3. CONTRACTOR SHALL PHOTOGRAPH ALL ADJACENT STRUCTURES TO DOCUMENT CONDITION PRIOR TO ANY EXCAVATION OR PLACEMENT OF SHORING. DOCUMENT AND PROVIDE INFORMATION TO THE ENGINEER PRIOR TO WORK.
 4. DEWATERING SYSTEM SHALL BE PROVIDED AND OPERATED BY THE CONTRACTOR. REFER TO THE GENERAL NOTES FOR ADDITIONAL REQUIREMENTS.
 5. CONTRACTOR SHALL PROVIDE TEMPORARY 6 FOOT SECURITY FENCING AROUND THE NEW AND EXISTING LIFT STATION DURING CONSTRUCTION. PAYMENT SHALL BE PAID INCLUDED IN OTHER ITEMS.

REVISION	BY	DATE	PLAN SCALE:	DRAWN	PGM	DATE	APPROVED:
ADDENDUM NO. 2	TJR	2-24-25	1"=10'	DESIGNED	TJR	02/2025	 DESIGN MANAGER ADVISEMENT DATE: 2024
			PROFILE SCALE:	SURVEY	CWC	02/2025	
			HORIZONTAL:	PROJ. MGR.			
			VERTICAL:	LEAD ENGR.			
			FILE:	DRAWING:	22TMUATURLEY	ADVISEMENT DATE: 2024	
			ATLAS PAGE NO: 947,636			SHEET 9 OF 24 SHEETS	

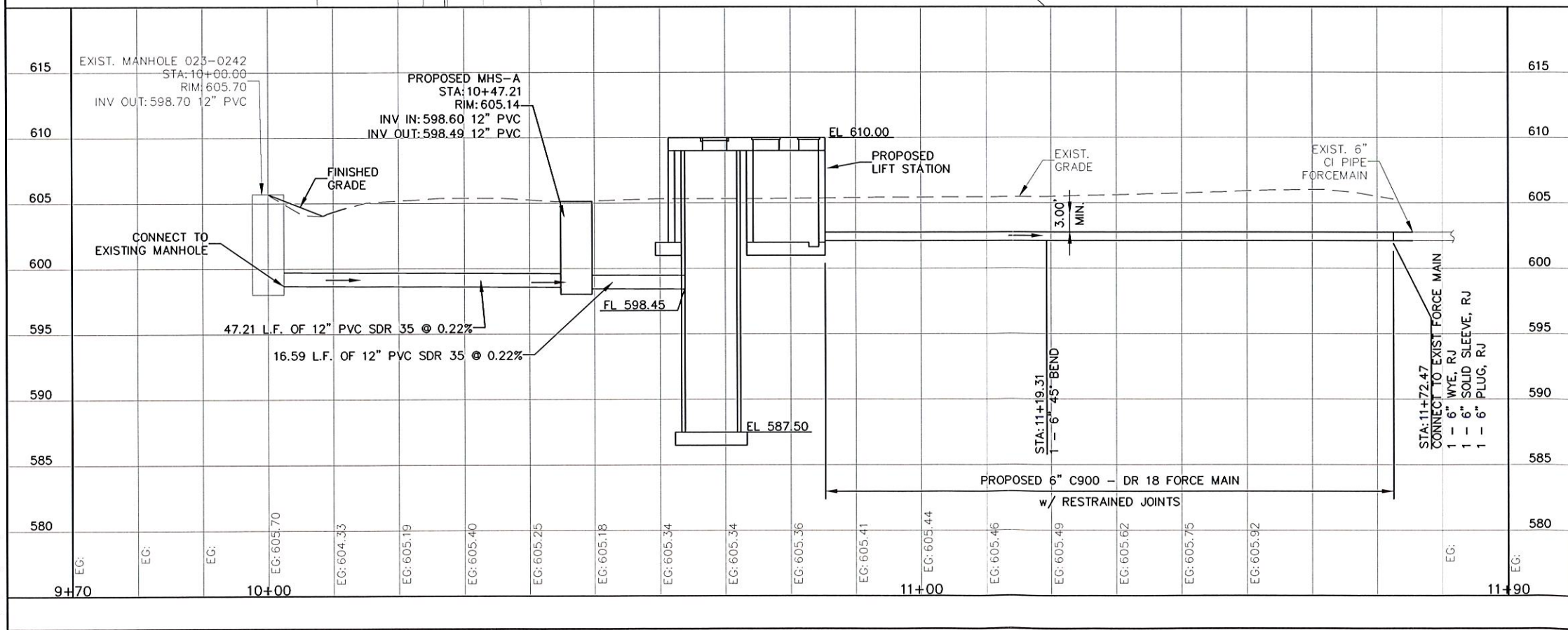
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- NOTES:
- SEQUENCE OF CONSTRUCTION:
 - CONSTRUCT AND PLACE THE NEW LIFT STATION INTO SERVICE.
 - ISOLATE THE EXISTING LIFT STATION AND OPERATE THE NEW LIFT STATION TROUBLE FREE FOR 14 CONTINUOUS DAYS.
 - UPON ACCEPTANCE OF THE NEW LIFT STATION OPERATIONS BY THE CITY OF TULSA. ISOLATE THE EXISTING LIFT STATION. PLUG AND REPAIR THE MANHOLE. REPLACE WYE AND PLUG VALVE WITH 6" 45° BEND. REMOVE THE ABANDONED 6" FORCE MAIN PIPING BETWEEN THE NEW WYE AND ABANDONED LIFT STATION.
 - DEMOLISH THE EXISTING LIFT STATION MINIMUM OF 3 FEET BELOW FINISHED GRADE. DEMOLISH A 24" HOLE IN THE FLOOR OF THE ABANDONED LIFT STATION DRY WELL AND WET WELL AND FILL BOTH WITH CONSOLIDATED WASHED #57 ROCK OR SAND.
 - ADDITIVE ALTERNATE NO. 2: IF AWARDED, NEW MANHOLE WILL NOT CONNECT TO EXISTING STATION. CONTRACTOR SHALL PROVIDE STAND-BY, BYPASS PUMPING UNTIL NEW STATION OPERATES FOR 14 CONTINUOUS, TROUBLE-FREE DAYS.

BASE BID

ADDITIVE ALTERNATE NO. 2
4' MANHOLE REPLACEMENT PET CITY OF TULSA STANDARD DETAIL 358 PRECAST SANITARY SEWER MANHOLES



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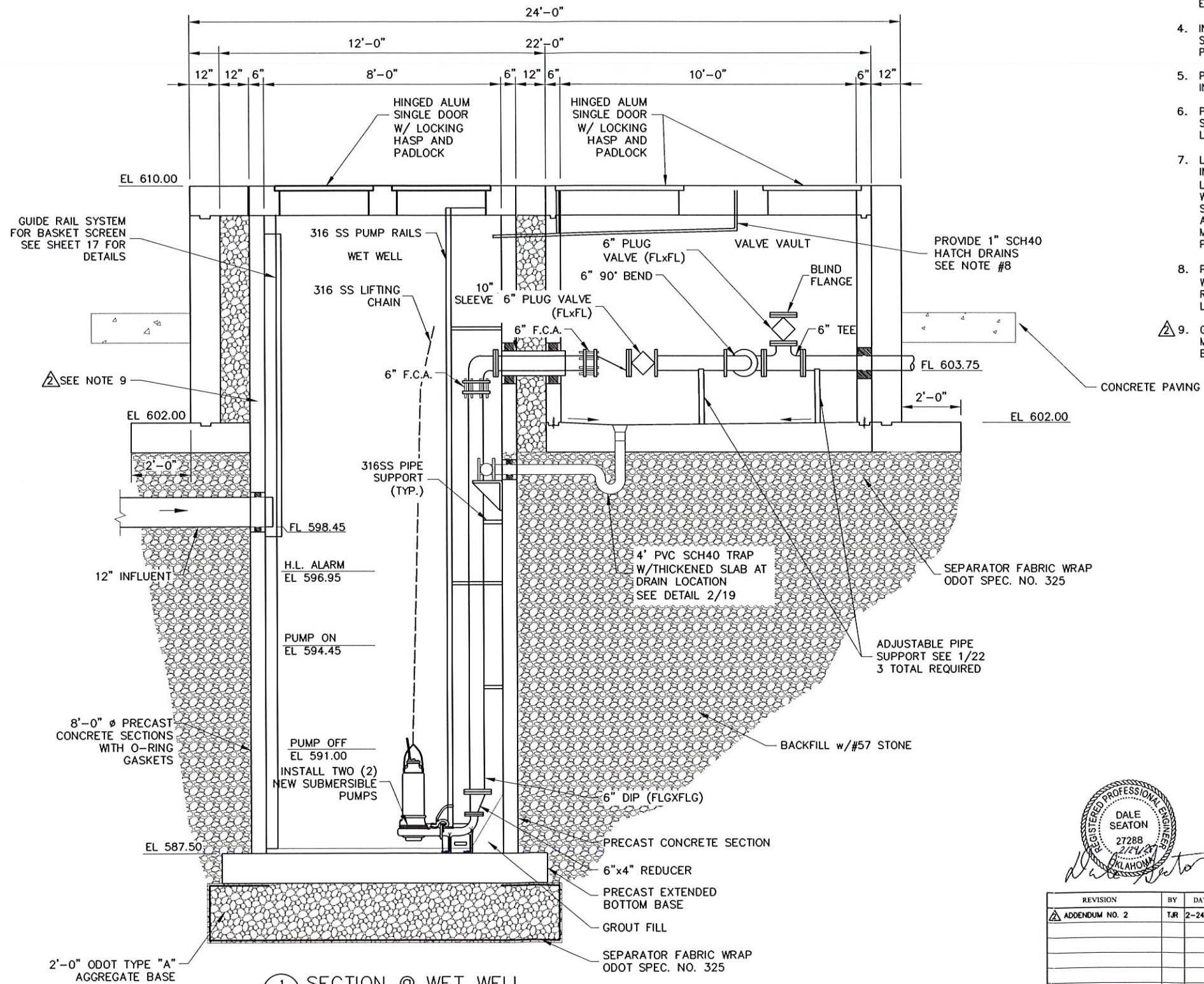
TURLEY NORTH LS PLAN & PROFILE
TMUA PROJECT NUMBER ES 2022-10
CITYWIDE LIFT STATION IMPROVEMENTS
CITY OF TULSA, OKLAHOMA
WATER AND SEWER DEPARTMENT

REVISION	BY	DATE
ADDENDUM NO. 2	TJR	2-24-25

PLANS AND ESTIMATES PREPARED BY:			
HOLLOWAY, UPDIKE + BELLEN, Inc.			
3008 N WILLOW AVE, BROKEN ARROW, OKLAHOMA 74006			
PH: 918-251-1111 FAX: 918-251-1114			
PLAN SCALE:	DRAWN	PGM	DATE
1"=10'	TJR	02/2025	APPROVED:
PROFILE SCALE:	SURVEY	CWC	02/2025
HORIZONTAL:	PROJ. MGR.		
1"=10'	LEAD ENGR.		
VERTICAL:	FIELD MGR.		
1"=5'			
FILE:	DRAWING:	22TMUA/TURLEY	ADVISEMENT DATE: 2024
ATLAS PAGE NO: 947,636			SHEET 11 OF 24 SHEETS

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- NOTES:**
1. ALL HARDWARE IN THE WET WELL MUST BE 316 SS STAINLESS STEEL OR BETTER (NO 304).
 2. PROVIDE 3'x3'x1' SUMP UNDER PERSONNEL ACCESS HATCH. SLOPE REMAINDER OF FLOOR TO SUMP. PROVIDE A LEVEL AREA FOR THE PUMPS PER MFR. SPECIFICATIONS.
 3. COAT INTERIOR OF WET WELL WITH EPOXY COATING. REFER TO SPECIFICATION SECTION 9.2 FOR REQUIREMENTS. INSTALL ALL ANCHOR BOLTS AND EMBEDMENTS PRIOR TO COATING APPLICATION.
 4. INSTALL 2" TAP AND 2" BRONZE BALL VALVE. VALVE SHALL BE PADLOCK LOCKABLE IN OPEN AND CLOSED POSITION.
 5. PROVIDE 316 STAINLESS STEEL LADDER. MP INDUSTRIES INCORPORATED OR EQUAL.
 6. PROVIDE AMTEC CORP. OR EQUAL 316 STAINLESS STEEL CABLE GRIPS AT ALL CABLE AND WIRE LOCATIONS.
 7. LADDER(S) MUST MEET CURRENT OSHA STANDARDS, INCLUDING BUT NOT LIMITED TO FIRST RUNG LOCATIONS/ELEVATION, WALL OFFSET, COORDINATION WITH HATCH LOCATION, BOTTOM STEP AND LANDING SPACE AT THE BOTTOM. CONTRACTOR SHALL SUBMIT AND COORDINATE INSTALLATION OF THE MANUFACTURED LADDER WITH SEWER OPERATIONS PRIOR TO INSTALLATION.
 8. PROVIDE 1" SCH 40 HATCH DRAIN(S) TO THE WET WELL w/ 316 SS PIPE SUPPORTS AT 2'-0" O.C. AS REQUIRED. FIELD ROUTE AND COORDINATE FINAL LAYOUT WITH OWNERS REPRESENTATIVE.
 9. GROUT FILL AND LAG BOLT GUIDE RAIL SYSTEM TO MANHOLE WALL TO PROVIDE FLUSH SURFACE FOR BASKET SCREEN.




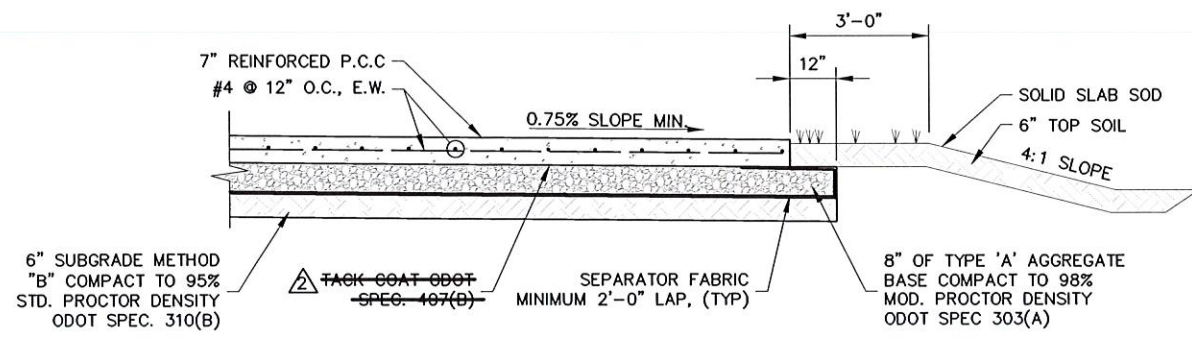
BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

TURLEY NORTH LIFT STATION SECTIONS
 TMUA PROJECT NUMBER ES 2022-10
 CITYWIDE LIFT STATION IMPROVEMENTS
 CITY OF TULSA, OKLAHOMA
 WATER AND SEWER DEPARTMENT

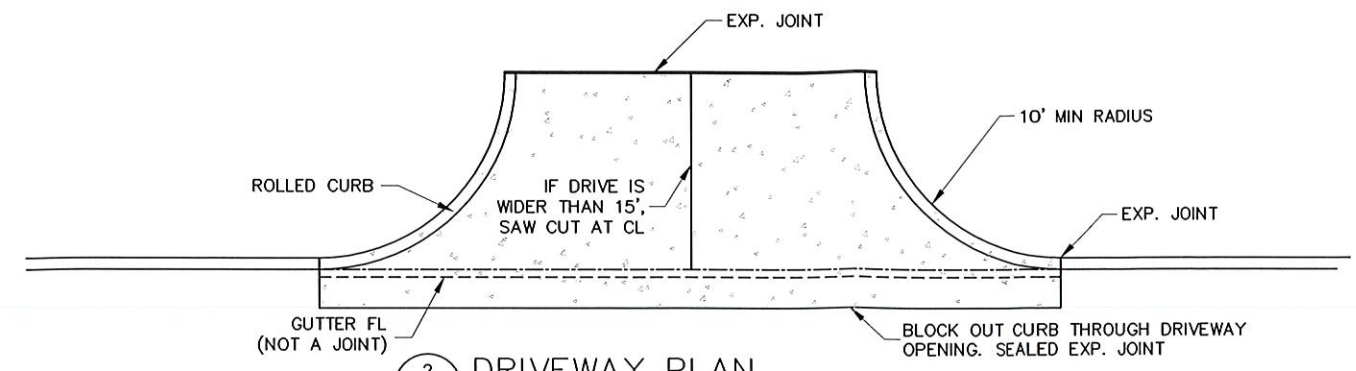


PLANS AND ESTIMATES PREPARED BY:
 HOLLOWAY, UPDKE + BELLEN, Inc.
 200 N WILLOW AVE, SPENCER, ARKANSAS, OKLAHOMA 74062
 (505) 328-0775, FAX (505) 328-0754

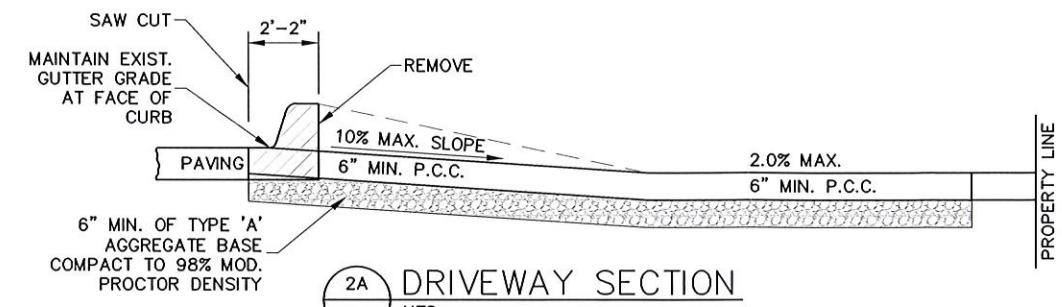
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			DESIGNED	TJR		09/2024	
			SURVEY	CWC		09/2024	
			PROJ. MGR.				
			LEAD ENGR.				
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			ATLAS PAGE NO: 947, 636				SHEET 14 OF 24 SHEETS



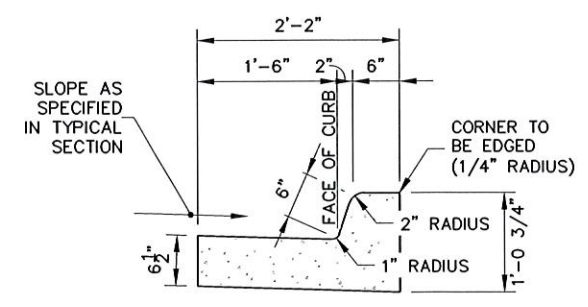
1 TYPICAL SECTION - PAVING
20 SCALE: 1/2" = 1'-0"



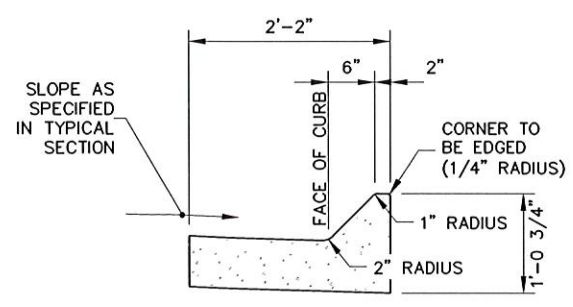
2 DRIVEWAY PLAN
20 NTS



2A DRIVEWAY SECTION
20 NTS




3 CURB & GUTTER
20 6\"/>



4 CURB & GUTTER
20 6\"/>



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MISCELLANEOUS DETAILS							
TMUA PROJECT NUMBER ES 2022-10							
CITYWIDE LIFT STATION IMPROVEMENTS							
CITY OF TULSA, OKLAHOMA WATER AND SEWER DEPARTMENT							
PLANS AND ESTIMATES PREPARED BY: HOLLOWAY, UPDKE + BELLEN, Inc. 2020 W WILLOW AVE, BROKEN ARROW, OKLAHOMA 74012 PH: 918-257-1234 FAX: 918-257-1234							
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FILE:			DRAWING: 22TMUATURLEY	ADVERSEMENT DATE: 2024			
ATLAS PAGE NO:			SHEET OF 24 SHEETS				

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