APPENDIX A – TECHNICAL SPECIFICATIONS

McMillan and Kinlock Pump Stations Force Mains Upgrade: Kinlock PS FM Diversion

The Company will provide all labor and material to divert flow from an existing 18” ductile iron sewer force main through the installation of approx. 1,750 LF of 16" DR 25 PVC sewer force main, by open cut method, terminating into a new “Type G” manhole, which will be cut into an existing 42” gravity sewer line.

901 GENERAL CONDITIONS

The General Conditions Lump Sum price shown on the Bid Form Workbook shall be compensation to complete the Work as required in the contract (except for items listed separately on the bid form workbook), including but not limited to, Payment Bond, Performance Bond, Safety, Quality Control, Preparation of Daily Reports, Maintenance of Traffic, Attendance at Meetings, Scheduling, Testing (if not included elsewhere). Payment of the General Conditions Lump Sum Price shall be based upon the percentage of Work completed: however, if the Company executed bond(s) accompany the first pay request then the amount paid will be deducted from the associated subtotal. Also, the Company shall include the cost for performing survey of the existing roadway horizontal alignment (prior to initiating any construction) in their initial General Conditions payment. In the event that changes to the work are required that are covered under the Supplemental Work Authorization account, the General Conditions Lump Sum Price will not be increased unless the total value of the SWA exceeds the original SWA account provided in the original contract bid.

902 QUALITY CONTROL AND QUALITY ASSURANCE

The Company shall provide Quality Control to ensure the Work is performed in accordance with the Contract. Quality Control shall be appropriate for the nature of the Work, and shall be conducted in a manner consistent with sound quality management and industrial engineering principles. The Company shall have only personnel trained in Quality Control techniques and experienced with the nature of the Work perform the Quality Control function.

JEA may perform Quality Assurance activities. Such activities whether performed or not, do not in any way limit or reduce the Company’s requirements. JEA may become aware of quality related problems during its performance of Quality Assurance, but has no obligation to notify the Company of its findings. The Company shall provide access to all areas of Work, including the Company’s facilities, for JEA Quality Assurance personnel and JEA Representatives. JEA will conduct Quality Assurance personnel request specific actions of the Company, the Company shall comply with the request and agrees that such compliance is included as part of its Contract Price.

903 BID DRAWINGS

Titled “015-19 Appendix A - Construction Drawings for Kinlock PS FM Diversion” prepared by Construction & Engineering Services Consultants, Inc. are attached.

904 GEOTECHNICAL REPORT

Titled “015-19 Appendix C - Report of Geotechnical Exploration – Kinlock FM Replacement – New Manhole Structure” prepared by ECS Florida, LLC is attached.

905 SUE TEST HOLE REPORTS

Test hole reports 1 through 4 Titled “015-19 Appendix C - Vacuum Test Hole Reports” prepared by Dyer, Riddle, Mills & Precourt, Inc. are attached.

906 RESPONSIBLE BIDDERS LIST (RBL) GC-11 LOCATE LINE VERIFICATION

Upon request by JEA, Company shall identify which subcontractor on JEA’s RBL GC-11 Locate Line Services Verification listing will be utilized for the installation of locate wire on PVC piping. The Company may obtain a list of prequalified persons and/or companies by contacting the JEA Procurement Bid Section, 21 W. Church Street, Suite 103, Jacksonville, FL 32202, (904) 665-6740, or by fax (904) 665-7294, or online at JEA.com.

907 UPDATED SURVEYING

In addition to the Surveying requirements set forth in Section 2.14.20 of this solicitation, the Company shall be responsible for staking the project stationing, easements and/or right-of-way boundaries. The survey datum used for this project is NAVD 1988. Staking shall be maintained throughout construction, including resurveying and restaking if the stakes are damaged or removed. All surveying shall be performed by a Professional Surveyor and Mapper (PSM) licensed in the State of Florida.

908 MAINTENANCE OF TRAFFIC

Payment for maintenance of traffic shall be included in the General Conditions lump sum price set forth in the Bid Form Workbook and shall include, but not be limited to, mobilization, excavation, embankment, pavement overbuild, sod, pavement marking removal, pavement marking removable tape, thermoplastic pavement marking, thermoplastic preformed pavement marking, permanent tape for concrete bridges, permanent tape for concrete surfaces, temporary reflective pavement markers, permanent reflective pavement markers, work zone signs, temporary barrier wall, temporary crash cushion, channelizing devices, milling existing asphalt pavement, superpave asphaltic concrete, grounding rumble strips and portable changeable message sign, removal of all MOT components, restoration of the FDOT Right-of-Way to existing conditions, cleaning up the site; furnishing all material, labor, tools, and equipment and all incidental and related work required to complete the work of the item. Maintenance of traffic shall be in accordance with the approved maintenance of traffic drawings and plan and the FDOT Utility Permit. Payment shall be made for the MOT mobilization and installation as two-thirds of the lump sum price. Payment shall be made for the MOT demobilization and removal as one-third of the lump sum price.

909 PIPE UNIT COST

Unit costs for pipes shall include all temporary pavements as necessary to restore the roadway after each working day, until final pavement repair is made.

910 PHASING

Any COJ standard pavement repair shall be completed within 10 calendar days or when 500 LF of roadway is disturbed after completion of the utility installation. All mobilization/demobilization required for rework/regrading of lime rock base, dust control, including asphalt paving shall not be paid for separately but shall be included in the cost of the associated items in the Bid Form.

911 PERMITS AND PLAN APPROVALS

JEA has obtained the following permits for the project:

- COJ Plan Approval – CDN 4161.249
- FDOT Utility Accommodation Permit: 2018-H-294-244

912 PERMIT COORDINATION MEETINGS

Company shall be responsible for being thoroughly familiar with all permit requirements prior to mobilizing and starting work associated with a particular permit. If a permit requires a notification or meeting with the issuing agency prior to starting work, Company shall be responsible for arranging said meeting and informing the JEA Representative. The following shall be attended by, but not limited to, the Company's Project Manager, Company's Site Superintendent, Permitting Agency Representative, JEA Project Manager and JEA Inspector.

913 COMPANY'S STAGING, STORAGE AND STOCKPILE AREA

No additional staging, storage, and stockpile will be made available by JEA along the project site. The Company is not allowed to store any equipment or materials outside the right-of-way and JEA's designated easement limits. The location will be agreed to upon and discussed at the pre-construction meeting.

914 TRAFFIC SIGNAGE

Costs incurred by the Company to provide new signage and pavement markers, or remove and replace existing signage as necessary to accomplish the work shall not be paid for separately but shall be merged with the cost of the associated item of work. Damaged signage shall be replaced with new signage. All signage and pavement markers shall be in accordance with the drawings and FDOT requirements.

915 CONNECTIONS TO EXISTING WATER AND SEWER UTILITIES

Company shall verify size and type of pipe at each connection prior to ordering materials for connections.

916 DEWATERING

If the Company encounters groundwater, the Company shall be responsible for utilizing a dewatering system(s) to remove water from the excavations. Prior to beginning any dewatering activities, the Company shall comply with all requirements listed in Florida Department of Environmental Protection (FDEP) Dewatering Regulations.

Additionally, prior to any dewatering, the Company shall apply for a St. Johns River Water Management District (SJRWMD) Generic Permit for Short Term Dewatering, and comply with all SJRWMD requirements.

If the above requirements are not followed, the Company shall be held liable for any fines and/or violations incurred by JEA.

917 TIE-IN CONNECTIONS SEQUENCING CONSTRAINTS

The following tie-in connections sequencing constraints are to emphasize critical tasks related to connections to existing systems for the work in this Contract. It is not a complete list of all work to be completed.

The Company shall give a minimum of 5 working days advance written notice to JEA of each component proposed for shutdown, tie-in, or disruption, all of which shall be subject to JEA's approval and limitation. The request shall include, but not be limited to, points of connection, fittings to be used, method of flushing, and estimated construction time for connection. All connections and ties to the existing system and transfer of services shall be performed by the Company under the JEA's direction. The Company shall not operate any valves in the existing system.

JEA reserves the right to postpone connections to existing utilities due to operational and/or weather related concerns.

Connection to the existing system may depend on the closure of certain valves. The existing valves may not be operable or may not seal properly. The Company shall coordinate with JEA in advance of connections to determine condition of existing valves.

918 LANDSCAPING

Except for trees designated for removal and/or replacement and areas within the designated limits of clearing on the contract drawings, the Company shall be responsible for protection and preservation of all trees, palms, shrubs, irrigation systems, landscaping, signs, and etc. along the route of the proposed work including hand digging, removal and storage of such and subsequent replacement to the fullest extent possible of the pre-existing condition. All costs associated with such shall not be paid for separately and shall be included in the unit prices of the associated items listed on the Bid Form Workbook.

919 GRASSING/SODDING

The Company shall replace all sod in-kind. St. Augustine type grass/sod will not be allowed in City of Jacksonville Right-of-Ways.

Disturbed areas within the FDOT and COJ Right-of-Ways must be restored to original or better conditions using sod which complies with the applicable FDOT or COJ requirements and specifications. All disturbed areas shall be restored by resodding (if grass was established pre-construction) or seeding and mulching in accordance with Section 441 of the JEA Water and Wastewater Standards Manual, titled, Grassing.

JEA will only pay for sod within a span of twelve (12) feet across the centerline of installed pipe along the approximate eight hundred (800) LF of FDOT ROW included in the scope of construction. Beyond these bounds, the Company will be responsible for supplying and

installing additional sod as required to restore disturbed areas to the satisfaction of JEA, at no cost to JEA.

All material and labor required to complete this work shall be included in the Bid Form Workbook line item for sodding.

920 SEEDING

All disturbed areas outside of designated sodding area shall be restored by seeding and mulching in accordance with Section 441 of the JEA Water and Wastewater Standards Manual, titled, Grassing.

JEA will only pay for seeding within a span of twenty-one (21) feet across the centerline of installed pipe along the approximate three hundred ninety-two (392) LF of pipe included in the scope of construction from STA 18+00 to STA 21+91.18. Beyond these bounds, the Company will be responsible for supplying additional seed as required to restore disturbed areas to the satisfaction of JEA, at no cost to JEA.

All material and labor required to complete this work shall be included in the Bid Form Workbook line item for seeding and mulching.

921 CLEARING AND GRUBBING

Payment for clearing and grubbing shall not be paid for separately, but shall be included in the cost of the associated item of work. Payment will be compensation in full for all clearing and grubbing required for the roadway right-of-way and for any other clearing and grubbing indicated or required for the construction of the entire project area including area of excavated trenches and where trenchless operations are required, including all necessary hauling, furnishing equipment, equipment operation, furnishing any areas required for disposal of debris, leveling of terrain and the landscaping work of trimming, etc. as required.

922 SWALE AND DITCH CONSTRUCTION / REGRADING

The Company shall re-grade all existing swales and ditches as necessary to restore the swales and ditches to their original (or better) condition. No separate payment shall be made for re-grading or construction of new drainage ditches as required for restoration, but shall be included in the Bid Form Workbook line item for pipe installation. Payment for sodding of swales and ditches will be separate.

923 DUST CONTROL

The Company shall utilize a water spray truck to mitigate dusty conditions when roadways are unpaved and construction areas are not sodded.

924 EARTHWORK

It shall be the sole responsibility of the Company to evaluate the geotechnical findings and recommendations along with the construction drawings to determine the quantity of soil to be managed or removed/disposed and replaced in order to meet the requirements of the Contract Documents. No separate payment shall be made for stockpiling, managing, mixing, and/or removal, disposal, importation and placement of A-3 sand required for backfill and/or over-excavation (bedding) material for the pipeline(s) and structures, but all costs shall be merged

with the associated item of work shown in the Bid Form Workbook. Excess and/or unsuitable material shall become the property of the Company and shall be disposed of outside of the right-of-way.

925 TURBIDITY BARRIERS

The Company shall take steps and make suitable provisions to minimize siltation and erosion of waterways that may result from its operation during the course of construction.

The Company shall make suitable arrangements, which may require temporary construction of flumes, boxes, or some other device(s), at the Work Location for the drainage and disposal of water. The Company shall be responsible for protecting adjacent property to the Work Location from damage by water resulting from its operation. The Work Location shall be returned to its original condition to the satisfaction of JEA.

The Company is cautioned that execution or maintenance that creates turbidity and that directly or indirectly affects the water quality of any waterway into which storm water is discharged in such a manner as to exceed the limitations prescribed in the Florida Administrative Code, is a violation of the water quality standards of the State of Florida.

Turbidity levels with the project area (including within 100 ft of the construction activity) shall not exceed background conditions.

The cost for turbidity barriers and other provisions for erosion control is included in the unit or lump sum price set forth in the contract for the items to which the turbidity barriers and erosion control provisions are incidental and appurtenant.

926 SEWAGE SPILLS

The Company shall minimize the amount of sewage released into excavations by notifying affected parties of the service interruption, pre-draining affected lines, insuring pump station (non-)operating status, etc. The Company shall notify JEA immediately verbally, with written notification to follow.

The Company shall take precautions to prevent sewage from contacting the ground. If sewage contacts the ground, the Company shall take appropriate measures to disinfect the area of the sewage release. If pooling sewage is observed, the Company shall vacuum remove the sewage, or remove the sewage by other means acceptable to the JEA Representative, and dispose of the sewage in accordance with environmental and public health regulations. The Company shall clear any sanitary systems found plugged due to this type of pumping activity at its own expense.

927 PLANNED OUTAGE FOR SEWER FORCE MAIN-SEWAGE DISPOSAL ALLOWANCE

The Company is to notify the JEA Project Manager a minimum of three (3) weeks prior to the planned outage request to tie into the 18” Kinlock Pump Station Force Main to start the force main diversion. The outage shall be scheduled to occur during low flow conditions as designated by JEA O&M Personnel. Values are to be operated by JEA personnel and affected JEA pumping stations shall be operated by JEA O&M Personnel. Contractor shall provide pump

trucks for private lift stations. Contractor shall coordinate with private lift station operation and maintenance contractor. JEA Representatives shall be present during interruption of service.

The tie-in shall be made by the Company. The Company shall also be prepared with a minimum of five (5) – 4,000 gallon tanker/pump trucks during the sewer force main outage in order to maintain lift stations as directed by JEA O&M Personnel and to pump down the sewage from the main at the connection pit or excavation. Pump truck discharge will be to a gravity manhole within a five (5) mile radius of the work area. The gravity manhole for the pump truck discharge shall be designated by JEA O&M Personnel. In addition, the Company shall provide crushed rock, lined with visqueen, as needed for the tie-in excavation with the intent to capture the pipeline wastewater for dewatering purposes. The Company shall submit with the corresponding pay application, verification of the hourly charge and the total number of hours of pump trucks utilized for justification of pass-through cost payment shown on the Bid Form. All other costs associated with the planned outage shall not be paid for separately; but, shall be included in the cost of the associated items in the Bid Form.

928 FORCE MAIN PROFILE ELEVATIONS

The force main profile shown on the contract drawings indicate the station and elevation for the air release valves (ARV). The ARV must be located at a high point. To ensure this requirement is met, the Company shall take station and elevation readings of top of force main pipe at 100 foot intervals. The data collected shall be taken during the progression of the pipeline installation. Once the stations and elevations are collected, submit to the JEA Representative prior to installing the ARV. The JEA Engineer will review the elevations to determine if the station (location) for the ARV needs to be adjusted from that shown on the force main (FM) profile. If the Company installs the pipeline such that additional high points are created on the pipeline profile beyond that shown on the contract drawings, the Company shall be solely responsible for furnishing and installing additional ARV/manholes at each of these high points. Elevations should be referenced to the survey benchmark.

929 ABOVE GRADE ARV ASSEMBLY

The 3-inch above grade ARV assembly located at STA 18+62.52, including all associated material and labor required to comply with Detail S-29 of the Construction Documents, shall be paid at the lump sum unit price set forth in the Bid Form Workbook.

930 UPDATED AS-BUILTS

Upon submission of each payment application, Company shall furnish to the JEA Project Manager a photocopy “redline” set of drawings identifying those field changes made to the Work to date, along with a photocopy set of the associated field notes. Revisions and recording of information on the photocopy set of drawings shall be done in scale in red ink clearly and accurately identifying those changes in the Work by a competent drafter. All “As-Built” information shall be recorded and kept current during the progress of the Work. The JEA Project Manager may review and comment on the drawings which shall be incorporated into the next month’s as-built submittal. Failure to incorporate changes the following month may result in denial of pay application request. These requirements only supplement the requirements of the General Conditions.

When the payment of application submitted includes associated items of final restoration for a project, or a portion of the project thereof, then the associated final as-builts shall be submitted as a “redline” marked photocopy set of drawings for that pay period. The Project Manager may review and comment on the drawings with the view toward final as-built submittal. The subsequent month submittal made with the payment application shall incorporate a photocopy set of CADD drawing final as-builts. The JEA Project Manager shall review and comment on the photocopy set of CADD drawings which shall be incorporated into the final as-built submittal. These requirements only supplement the requirements of the General Conditions.

931 EXISTING UTILITIES

Known surface and subsurface utilities are shown or noted on the drawings as accurately available information will permit. JEA does not guarantee the information shown or noted or that utilities other than those indicated (on the drawings) do not exist. It is the responsibility of the Company to notify each of the utilities at least (15) fifteen working days prior to construction and request that the location of their respective utility or material be located and staked in the field. Should the company encounter unidentified utility, work in the immediate area shall promptly cease and the JEA representative shall be advised. JEA shall investigate the condition and propose remedial action. The Company is reminded of the laws of Florida requiring notification of Gas Company, at least four (4) working days in advanced of any digging operation. The Company shall call the Sunshine State One Call of Florida (811) to request location of all facilities owned by utilities that participate in the locate program. Failure by the company to contact Sunshine One Call of Florida prior to digging shall obligate the Company for damages to participating utility company and associated repair cost.

In order to reduce the disruption and cost of utility damages occurring in the COJ ROW and Easements, the Company shall prevent damages to existing utilities caused by its work through field verification of the location of existing utilities. In the case of open excavation, verification may be performed during the Company’s work.

Company shall verify the location of existing utilities as needed to avoid contact. Existing utilities shall be exposed using detection equipment or other acceptable means. Such methods may include but shall not be limited to “soft dig” equipment and ground penetrating radar (GPR). The excavator shall be held liable for damages caused to the city’s infrastructure and the existing facilities of other utility companies.

932 UTILITY POLE HOLDING/SUSPENDING

Holding or suspending of utility poles including power poles and telephone poles shall be performed as needed, and when trenching or excavating is within a horizontal distance from the pole that is less than the depth of the trenching or excavation. Work shall include, but not limited to, furnishing of all material, labor, supervision, tools, and equipment as required to hold/suspend utility poles. Company shall review the project and notify the JEA Project Manager of all anticipated holds/suspends within ten (10) days following the notice to proceed. JEA will be responsible for the coordination and provision of utility pole holds/suspends. Notice, giving the exact date and time, for each hold/suspend, shall be provided by the Company in writing to the JEA Project Manager at least two weeks in advance of each hold/suspend. No separate pay

item will be made to the Company separately, but shall be included in the cost of the associated items in the Bid.

933 VALVE AND LOCATE WIRE BOX IDENTIFICATION MARKERS

The Company shall furnish and install fiberglass identification markers at all gate valve and locate wire box locations as directed by the JEA Representative. All costs associated with this work shall be included in the associated line item in the Bid Document.

934 FDOT PAVEMENT MARKING REQUIREMENTS

- Pavement markings should be placed as shown on the plans and detail sheets. If no specific striping comments are noted on the drawings, the Company shall replace damaged/removed striping due to construction activities with like striping and/or reflectors all in accordance with FDOT requirements.
- Any required temporary markings must be in place before opening lanes of traffic. Pay items for temporary pavement markings are not paid for separately but included in the associated item of paving.
- The removal of existing pavement markings will be considered an incidental item with no additional compensation provided.
- All permanent pavement markings shall be extruded thermoplastic and meet FDOT standard specifications, latest edition.
- Thermoplastic pavement markings are to be placed no sooner than 30 calendar days after the completion of the final pavement layer.
- A bituminous reflective pavement marker (RPM) adhesive meeting current FDOT specifications shall be used on asphalt roadways.
- Reflective pavement markers that do not conflict with permanent (thermoplastic) markings shall be placed on all final asphaltic concrete surfaces immediately after the temporary permanent striping is in place.

935 FDOT UTILITY PERMIT

The Company shall comply with all requirements and instructions in the approve FDOT permit 2018-H-294-244 and the latest edition of FDOT's Standard Specifications for Road and Bridge Construction including, but not limited to, the following:

- Lane closure restrictions, Monday through Friday, -No lane closures allowed from 7:00AM to 9:00AM and from 4:00PM to 6:00PM.
- Abandoned utilities must be grout filled or removed completely.
- Signed and sealed dewatering plan prior to commencing work.
- Signed and sealed shoring plan prior to commencing work.

936 COJ PAVEMENT MARKERING REQUIREMENTS

- Pavement markings should be placed as shown on the plans and detail sheets. If no specific striping comments are noted on the drawings, the Company shall replace damaged/removed striping due to construction activities with like striping and/or reflectors.

- Any required temporary markings must be in place before opening lanes of traffic. Pay items for temporary pavement markings are to be included in the tabulation of quantities.
- The removal of existing pavement markings will be considered an incidental item with no additional compensation provided.
- All permanent pavement markings shall be extruded thermoplastic and meet current City of Jacksonville specifications and FDOT standard specifications, latest edition.
- Thermoplastic pavement markings are to be placed no sooner than 30 calendar days after the completion of the final pavement layer.
- A bituminous reflective pavement marker (RPM) adhesive meeting current City of Jacksonville and/or FDOT specifications shall be used on asphalt roadways.
- The Company shall use 4”x4” CLASS –B reflective pavement markers (RPMs) installed to meet current City of Jacksonville specifications and/or FDOT standard specifications. Acceptable examples are: Ennis Paint co., Model 911; Ray-O-Lite, Model AA-ARCII-FH; Apex, 921AR.
- Reflective pavement markers that do not conflict with permanent (thermoplastic) markings shall be placed on all final asphaltic concrete surfaces immediately after the temporary permanent striping is in place.

The Company SHALL contact the Pavement Marking Inspector (904-387-8861) 48 hours PRIOR to installing any pavement markings of any City of Jacksonville roadway or streets.

937 TEMPORARY GRAVITY BYPASS PUMP & PIPE SYSTEM

PART 1- GENERAL

All material and labor required to complete this work shall be included in the Bid Form Workbook line item for Gravity By-pass Pump & Pipe System.

1.1 SCOPE OF WORK

A. Design, furnish, install, operate, maintain, and remove all temporary bypass pumping and piping system(s) necessary for the construction of structures and piping as shown on the drawings.

B. During work associated with the abandonment and replacement of the existing 18- inch force main with a new 16-inch force main and discharge manhole, and required piping re-connections, the CONTRACTOR shall have operationally ready an online temporary bypass pumping and piping system. The specified areas in which bypass pumping and piping systems will be allowed is shown on the project plans.

C. The CONTRACTOR shall be responsible for any and all violation notices, fines and remediation measures as a result of wastewater spillage or discharge associated with bypass pumping and piping activities and/or modifications and removal of existing structures and piping. The CONTRACTOR shall be responsible for all jobsite, motor vehicle traffic, and general public safety and protection during all work.

D. The CONTRACTOR shall provide all trained and experienced labor and

supervision for operating and maintaining the pumping and piping systems during the entire bypass pumping operation.

E. The actual duration of bypass pumping and piping time depends on the CONTRACTOR's time required to perform the necessary pipe and structure removals, replacements, testing and connections. The actual bypass times may vary depending on the CONTRACTOR'S plan of work. The CONTRACTOR will not be granted additional monies for bypasses, which extend beyond the approved plan of work time frame. The ENGINEER makes no estimations of the time required or need to bypass pump.

F. It is the intent for the bypass pumping system to operate and be controlled by a series of wastewater floats to automatically start and stop pumps, depending on water levels in the manhole(s). The bypass pumping system shall include an auto- dialer to alert and alarm the CONTRACTOR's and JEA's designated staff by cell phone communication of potential failures prior to any high-water alarms. The CONTRACTOR shall be responsible for ensuring proper operation and maintenance of the temporary bypass pumping system.

1.2 RELATED WORK

A. Related work for the pumping and bypass piping systems shall be as in the contract plans, documents, JEA Water and Wastewater Standards Manual latest edition, as amended, regulatory permit conditions, and direction by JEA.

1.3 SUBMITTALS

A. Submit to JEA, detailed drawings and descriptions outlining all provisions and precautions to be taken by the CONTRACTOR to establish compliance with this Section. The bypass pumping and piping systems shall be designed by a Florida Professional Engineer with signed and sealed drawings, calculations and equipment selections submitted for review.

B. The drawings shall include but not limited to details of the following for any bypass pumping operation:

1. Staging areas for pumps.

2. Sewer plugging method and types of plugs.

3. Number, size, material, location, and method of installation of suction piping.

4. Number, size, material, method, of installation and location of installation of discharge piping.

5. Bypass pump sizes, capacity, number of each size to be on site, power requirements, and fuel consumption and onsite storage requirements

under full load.

6. Hydraulic calculations of static lift, friction losses and flow velocity (pump curves showing each pump's operation range shall be submitted).

7. Downstream discharge piping, valve and fittings plan.

8. Method of protecting discharge structures from erosion and damage.
9. Thrust and restraint block sizes, mechanical joint restraints and locations.

10. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill.

11. Verification that the pumps and all stationary fossil fueled equipment meet and have been permitted under the City of Jacksonville Ordinance Code for Noise Control, Chapter 368 and are "residential silenced" equipped.

12. Any temporary pipe supports and anchoring required.

13. Design plans and computation for access to bypass pumping locations indicated on the drawings.

14. Calculations for selection of bypass pumping pipe size(s).

15. Schedule for installation of and maintenance of bypass pumping pipes, valves and fittings.

16. Plan indicating selection location of bypass pumping pipes.

17. Details on pump controls and instruments to safely operate and alarm of conditions. Provide sequence of CONTRACTOR's emergency response contacts for the autodialers.

18. An emergency response plan, which must also be reviewed and approved by the CONTRACTOR and submitted to JEA for comment.

1.4 QUALITY ASSURANCE

A. The design, installation, operation, and maintenance of the temporary bypass pumping and piping systems shall be the CONTRACTOR's responsibility. The CONTRACTOR shall employ the services of a vendor who can demonstrate to JEA that it specializes in the design and operation of temporary raw sewage bypass pumping and piping systems. The vendor shall provide at least five (5) references of projects of a similar size and complexity as this project performed by this vendor within the past three (3) years.

B. The proposed temporary bypass pumping and piping systems shall meet the requirements of all codes and regulatory agencies having jurisdiction.

C. The bypass pumping and piping specialty vendor shall have been in business for a minimum of fifteen (15) years. They shall have a major service center with on-call maintenance and service staff available to respond onsite within two (2) hours of notification.

D. The JEA approved bypass pumping and piping specialty contractors are:

1. Xylem/Godwin/Flygt
2. Sunbelt Rentals, Inc.
3. Thompson Pump and Manufacturing, Inc.
4. United Rentals

1.5 SYSTEM DESCRIPTION

A. The temporary bypass pumping and piping systems shall have sufficient capacity as described in this specification. The CONTRACTOR shall provide all pipeline plugs, pipe supports, line stops, pumps of adequate size to handle minimum and peak flows and suction and discharge piping to ensure that the total flow can be safely diverted around proposed new work.

B. Temporary bypass pumping and piping systems shall be capable of bypassing the flow around the work area and discharge into the identified existing JEA discharge manhole.

C. The temporary bypass pumping and piping systems shall include all necessary controls and instruments to operate the system in automatic mode, adjust the number of pumps and provide alarms.

D. Temporary bypass pumping and piping system friction and minor losses and the appropriate size and number of pumps shall be determined by the bypass pumping vendor's Florida licensed Professional Engineer in order to achieve the required flows.

E. The bypass pumping and piping systems vendor shall provide an onsite diesel fuel storage tank(s) and containment for the pumps. JEA will provide and deliver fuel to the system throughout the bypass pumping operations. The vendor shall coordinate with the CONTRACTOR and JEA to arrange for fuel deliveries in a timely manner. The onsite fuel storage tank(s) shall be sized to store enough fuel for running the entire system for a minimum of three (3) days continuously, under full load.

F. It is essential to the operation of the existing sewer system that there will be no interruption in the flow of sewage throughout the duration of the work. The CONTRACTOR shall provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment, conduits, all necessary power and all other labor and equipment necessary to intercept the sewage flow before it reaches the point where it would interface with the work, carry it past the work and return it to the existing sewer downstream of the work without causing a spill or discharge of the sewage to the environment.

G. The CONTRACTOR shall provide all necessary means to safely convey the sewage past the work area. The CONTRACTOR will not be permitted to stop or impede the sewage flows under any circumstances.

H. The CONTRACTOR shall maintain sewage flow around the work area in a manner that will not cause surcharging of sewers or damage to sewers and that will protect public and private property from damage and flooding.

I. The CONTRACTOR shall protect water resources, wetlands and other natural resources.

J. The design of the temporary bypass pumping and piping system for the existing gravity sewer system (See location on drawing number C-7) shall have the capacity for at least the typical average daily flow conditions of 3.175 mgd (2,205 gpm) and peak hour flow of 7.79 mgd (5,410 gpm).

PART 2 - PRODUCTS

1.1 PUMP SYSTEM

A. All pumps used shall be fully automatic self-priming units that do not require the use of foot-valves or vacuum pumps in the priming system. The pumps shall be diesel powered. No equipment including pumps shall exceed the noise limit of the City of Jacksonville Ordinance Code for Noise Control, Chapter 368 and shall be “residential silenced” equipped. If necessary to achieve this limitation, sound enclosures shall be provided. Work is within residential area.

B. Pump shall be capable of handling raw, unscreened, sanitary sewage containing solids and fibrous materials. Pumps shall be non-clog and shall be capable of passing 3-inch solids.

C. All pumps used must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of influent flows.

D. Spare parts for the pumps and piping shall be kept on site as required. Adequate hoisting equipment for each pump and accessories shall be maintained on site.

E. The vendor shall provide the necessary stop/start controls and alarms for each pump. Auto-dialers shall be used to alert the CONTRACTOR and JEA of problems, if a header system is used to manifold the pumps, each pump shall include an auto- dialer.

F. The total bypass pumping capability shall be a minimum as described below. All units shall be fully operational. Any unit which fails to operate at its rated capacity shall be repaired or replaced immediately. The CONTRACTOR is advised that the JEA has no control over the maximum flows that will occur in the sewer.

G. The bypass pumping system shall have a firm capacity of 5410 gpm, minimum. At least one stand-by pump shall be provided.

H. The maximum allowable sewage depth in the local collection system manhole serving the temporary bypass pumping system suction lines shall not exceed 4.0 feet

1.2 PIPING SYSTEMS

A. The bypass piping may be of new or used materials and shall not leak during operation. Under no circumstances will aluminum “irrigation” type piping or solvent cemented PVC pipe be allowed.

B. High density polyethylene (HDPE) pipe used for the bypass piping shall comply with JEA Standard Specification Sections 755 I.6 and II.1.1. The HDPE pipe may be new or used. Used pipe shall have the nominal pipe diameter, pipe size (iron pipe size-IPS or ductile iron pipe size-DIPS) and dimension ratio (DR) readily visible on each pipe segment, or otherwise readily identifiable. The pipe used for the bypass shall have a DR equivalent or greater pressure rating than the specified test pressure. All HDPE pipe used for the bypass piping shall be of the same pipe size and dimension ratio, no exceptions. All pipe used for the bypass piping shall be free of gouges, cuts, scrapes or other physical deformities on the inside and outside barrel of the pipe equivalent to, or greater than, 10% in depth of a new pipe segment DR wall thickness.

C. Only flanged joint or HDPE electro or thermal fused joint connections shall be allowed. Mechanically restrained adaptors are PROHIBITED on the discharge side of pumps, discharge header, inline fittings or the bypass piping. Shop-fabricated flexible hose less than 8 feet in length with flanged ends may be used to connect pumps to discharge manifold. If used, flexible hose shall have a minimum pressure rating of 100 psi.

D. Electrofusion couplings are not allowed on pipe sizes larger than 12-inch diameter. They may be used on smaller pipes where the butt fusion method cannot be used. Electrofusion couplings and fittings shall be PE4710 HDPE, Cell Classification of PE 445574C as determined by ASTM D3350-05. Electrofusion couplings or fittings shall have a manufacturing standard of ASTM F1055. Couplings and fittings shall have the same pressure rating as the pipe unless otherwise specified on the plans. Approved manufacturers are Friatec, Central Plastics and Plasson.

1.3 SEWER PLUGS

A. Any sewer plugs required for temporary bypass pumping and piping shall be of the compressed air type and shall be capable of and suitably anchored for water heads to final grade.

B. All sewer plugs shall have zero leakage.

C. The CONTRACTOR shall supply plugs with sufficient supply hose to extend above grade and include an inline pressure gauge to be monitored daily (minimum) to ensure no leakage in each plug. Each plug shall be securely tethered to prevent a dislodged plug from flowing uncontrolled downstream in any pipe.

1.4 EMERGENCY RESPONSE PLAN

A. The CONTRACTOR's emergency response plan shall have the following minimum components:

1. 24-hour electronic monitoring of the pumping system

2. A call path or sequence for an emergency and on-call staff response

3. Requirements of onsite tools and parts

4. Record keeping requirements

B. The CONTRACTOR shall provide technician(s) capable of maintaining and trouble- shooting the bypass pumping and piping systems on-call in case of an emergency on a 24-hour basis to maintain or re-establish pump sets and level of the water. The technicians shall submit incident reports and turn them into JEA within 24 hours of any incident. The technicians shall respond and be onsite to an emergency call within two (2) hours of notification.

C. The CONTRACTOR, JEA and JEA Pump Station Plant Operator(s) shall be linked by cell phone 24-hours a day during the course of bypass operations. Any alarms shall initiate a call to the CONTRACTOR and JEA. JEA and CONTRACTOR shall each have a minimum of three (3) individuals listed within the 'calling tree'. If the first contact does not confirm receipt of the alarm call, then the next contact shall be called until the alarm is either

confirmed and/or all three (3) contacts are called. JEA's link into the alarm status is only for informational purposes. The CONTRACTOR shall be responsible for all bypass alarm conditions and shall be required to resolve the condition that is causing the alarm to occur.

PART 3 – EXECUTION

3.1 DESIGN

A. The CONTRACTOR shall employ the services of a Florida licensed Professional Engineer to design the temporary bypass piping, pumping and control systems. The design shall be submitted for approval. The temporary bypass piping, pumping and control system plan and layout shall be approved by JEA before bypassing may begin.

B. Approval of the design shall not relieve the CONTRACTOR from full responsibility for performance of the system.

C. The temporary bypass pumping plan shall include design information on the proposed pumps including operating conditions.

3.2 INSTALLATION

A. Notify JEA at least 48 hours prior to implementing the temporary bypass pumping and piping systems.

B. System layout shall provide for ready removal and replacement of every pumping unit without affecting the others.

C. No debris of any type shall be allowed in the piping system. Protective barriers and covers shall be installed in this regard. Any debris inadvertently allowed into the system shall be immediately removed.

D. When bypassing is required, the CONTRACTOR shall supply the necessary pumps, piping and other equipment to divert the flow of wastewater around the work to be performed.

E. The CONTRACTOR shall remove manhole sections or make connections to the existing gravity sewer, and/or force main system and construct temporary bypass pumping and piping structures only as described in the specifications or as approved by JEA.

F. When working inside manholes or force mains, the CONTRACTOR shall exercise caution and comply with OSHA and JEA requirements when working in the presence of sewer gases, combustible oxygen-deficient atmospheres, raw sewage and confined spaces.

G. The CONTRACTOR shall be responsible for furnishing the necessary material, equipment, labor and supervision to set up and operate the temporary bypass pumping and bypassing system. The temporary bypass pumping and piping system shall be fully inspected at least three times a day to ensure that the system is working correctly.

H. The CONTRACTOR shall pressure test the piping for leaks prior to use.

I. All bypass operations shall be properly secured and fenced. The CONTRACTOR shall install temporary barricades around all bypass equipment to restrict access to unauthorized persons. A minimum of new, 4-foot-high, orange safety fence with T- stakes every 10 feet shall be installed and maintained during the entire bypass operation.

3.3 FLOW CONTROL MEASURES

A. The CONTRACTOR shall be responsible and liable for any wastewater spills and overflows resulting from improper operation or inadequacy of the temporary bypass system, including reporting to regulatory agencies and paying the resulting fines and penalties.

3.4 REMOVAL AND RESTORATION

A. The CONTRACTOR shall remove all temporary bypass pumping and piping system components and restore any modifications to the existing manholes or structures as directed by JEA. Any soil containing grease, oil or fuel from the pump engines shall be removed from the site and replaced with topsoil and sodded. All pavement, grassed and landscaped areas shall be restored to at least pre-construction condition.

B. The sewer plugs and all appurtenances shall be removed and any damaged to the sewers or other pipes shall be repaired.

END OF SECTION 9 3 7

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