



CITY OF COLUMBIA

Department of Utilities and Engineering Division of Engineering

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February 17, 2015

Project: CIP No. SS695401
48" Sanitary Sewer Interceptor Replacement Along
Broad River and Crane Creek

Addendum No. 2

TO: ALL HOLDERS OF RECORD OF CONTRACT DOCUMENTS

The Contract Documents for the above-referenced Project are modified as set forth in this Addendum. The original Contract Documents and any previously issued addenda remain in full force and effect, except as modified by this Addendum, which is hereby made part of the Contract Documents.

Acknowledge receipt of this addendum by inserting its number and date in the bid form. Failure to do so may subject bidders to disqualification. This addendum forms a part of the Contract Documents and modifies or clarifies the original "Contract Documents" for this Project dated January 29, 2015.

A. This Addendum consists of 28 pages and 3 attachments which are as follows:

- Attachment 1 - Proposal Bid for Unit Price Contracts
- Attachment 2 - Section 03480, Precast Reinforced Concrete Vault
- Attachment 3 - Base Bid Equipment Manufacturers and System Suppliers

B. The following changes are made to the Project Bidding Documents:

Item 1 Proposal Bid for Unit Price Contracts

Pay Item No. 6.0, Ductile Iron Pipe Gravity Sewer, Subparagraph 6.14, 54" Diameter (Open Trench) is added after 6.13, 48" Diameter, Restrained Joint. See Proposal Bid for Unit Price Contracts for full text.

Item 2 Proposal Bid for Unit Price Contracts

Pay Item No. 13.0, Manhole Precast Concrete Riser Ring, the "Unit" is replaced with the following: "Each." See Proposal Bid for Unit Price Contracts for full text.

Item 3 Proposal Bid for Unit Price Contracts

Pay Item No. 32, Riprap (SCDOT Type C) is added after Pay Item 31, Removal and Disposal of Unsuitable Material. See Proposal Bid for Unit Price Contracts for full text.

Item 4 Proposal Bid for Unit Price Contracts

Pay Item No. 33, Precast Reinforced Concrete Vault is added after Pay Item 32, Riprap (SCDOT Type C). See Proposal Bid for Unit Price Contracts for full text.

C. The following changes are made to the Project Special Provisions:

Item 1 Section 2.0, Project Scope, In the third paragraph replace item “d” that begins “Furnishing, installing 1 precast” is replaced with the following:

- d. Furnishing and installing 1 precast concrete manhole as part of the new 8” sewer (1-5’ diameter outside drop precast concrete manhole) and a second manhole (4’ diameter which is to be raised). The 4’ diameter manhole is topped by an eccentric cone section and the rim is set at grade.

Item 2 Section 2.0, Project Scope, In the third paragraph add the following after item “g” that begins “Furnishing, installing and ultimately”

- h. Furnishing and installing 20 lf. of 54” slip-on joint ductile iron pipe to serve as stub-out for future pipe connection.

Item 3 Section 2.0, Project Scope, In the third paragraph add the following after item “h” that begins “Furnishing, installing and ultimately”

- i. At the existing manhole where the 36” Crane Creek gravity sewer and the 36” Smith Branch gravity sewer come together the departing pipe is 48” in diameter.

Item 4 Section 2.0, Project Scope, 1, Site Specific Health and Safety Plan (HASp), paragraph 12, is replaced with the following:

For collection of samples of groundwater note the following:

1. Sampling points are to be constructed in accordance with SCDHEC R.61-71, South Carolina Well Standards
2. Screen is to include a filter pack
3. The sampling point is to be developed and purged
4. Samples are to be collected at half the depth of the water column
5. Analytical Parameters

Contamination Indicators pH, Ω^{-1}

Water Quality Total organic carbon (TOC)
Total organic halogen (TOX)
Cl⁻, Fe, Mn, Na⁺, SO₄⁻:Alkalinity or Acidity (Field)
Phenols Ca⁺⁺, Mg⁺⁺,K⁺, NO₃⁻, PO₄⁻, silicate,
ammonium

Drinking Water Suitability As, Ba, Cd, F⁻, Pb, Hg, NO₃⁻, Se, Ag
Endrin, lindane, methoxychlor, toxaphene

By endorsement, ISO Form CA 9948 Endorsement – Pollution Liability – Broadened Coverage (or equivalent) CA 9948.

52.4.2 Coverage:

- 52.4.2.1 Owned automobile/truck
- 52.4.2.2 Non-owned automobile/truck
- 52.4.2.3 Hired automobile/truck

52.5 Waiver of subrogation in favor of the City of Columbia.

Item 8 Section 53.0, Contractor’s Pollution Liability Insurance - This Section is added after Section 52: CONTRACTOR’S POLLUTION LIABILITY INSURANCE

53.0 FUEL ADJUSTMENT CLAUSE

53.1 This fuel oil adjustment clause provides for a price adjustment in the form of payment to the Contractor or a credit to the City for increases and decreases in the cost of motor fuel (both diesel and gasoline) consumed by the Temporary Bypass Pumping System in the performance of this project. The adjustment clause is applicable only to Temporary Bypass Pumping System.

The fuel oil adjustment clause is not intended to compensate the Contractor for normal day-to-day fluctuations and seasonal changes or to serve as a guarantee of full compensation for motor fuel price fluctuations.

The fuel oil adjustment clause will remain in effect throughout the life of the agreement for services.

Enactment of these provisions will only be considered when the increase or decrease in the price of motor fuel per gallon exceeds ten (10) percent.

The City will establish a Base Fuel Price (BFP) for fuel to be used by the Temporary Bypass Pumping System. The Base Fuel Index will be the price shown for “State Contract for Ultra Low Sulfur Diesel (ULSD) Off Road,” (Zone 2), (Transport) as shown on the SC Budget and Control Board, Procurement Services, Agency Users – Daily Fuel Prices, Daily ULSD Off Road Prices, (website <http://procurement.sc.gov/PS/agency/PS-agency-fuel-prices.phtml>) in existence on the date when a Notice to Proceed is given to the Contractor.

A Current Fuel Price (CFP) in cents per gallon will be established for each month. The CFP will be the average of the high and low prices shown for the “State Contract for Ultra Low Sulfur Diesel (ULSD) Off Road, (Zone 2), (Transport)” averaged for the beginning and ending dates of the monthly period being adjusted (i.e. 1/1/2015 to 1/31/2015 for the 2/1/2015 adjustment, if any).

The Contractor will compute the ratio of the CFP to the BFP (CFP/BFP) each month as part of the monthly application for payment for review by the Owner’s Representative. In addition, the Contractor will submit a log of gallons of motor fuel used.

If the CFP/BFP ratio falls between 0.90 and 1.10, no fuel adjustment will be made that month. If the ratio is less than 0.90, a credit to the City will be computed. If the ratio is greater than 1.10, additional payment to the Contractor will be computed.

If the CFP is greater than the BFP, the following formula shall be used to determine the amount of Fuel Cost Adjustment (FCA) to be paid to the Contractor.

$$(1) \text{ FCA} = [(\text{CFP}/\text{BFP}) - 1.10] \times \text{Q} \times \text{BFP}$$

If the CFP is less than the BFP, the following formula shall be used to determine the amount of FCA to be credited to the City.

$$(2) \text{ FCA} = [(\text{CFP}/\text{BFP}) - 0.90] \times \text{Q} \times \text{BFP}$$

Where, FCA = Fuel Cost Adjustment (cents)
CFP = Current Fuel Price (cents per gallon)
BFP = Base Fuel Price (cents per gallon)
Q = Monthly total gallons of fuel

53.2 Basis of Payment

A FCA payment to the Contractor will be included as part of each payment for the previous month's construction activities.

A FCA to the City will be deducted as a lump sum each payment period from any payment due the Contractor.

Upon completion of the work under the Contract, any difference between the estimated quantities previously paid and the final quantities will be determined. The CFP in effect on the day of completion of the Contract will be applied to the quantity differences in accordance with the procedures set forth above.

Adjustment Examples based on recent figures:

Example 1:

Assume Q = 2,000 gallons of fuel

CFP (Avg. of high and low prices per State Contract) = \$2.2315 per Gal

Established BFP = \$2.5534 per Gal

CFP/BFP = (0.87); since 0.87 < 0.90 use Eqn. (2)

$$\begin{aligned} \text{FCA} &= [(\text{CFP}/\text{BFP}) - 0.90] \times \text{Q} \times \text{BFP} \\ &= [0.87 - 0.90] \times 2,000 \times \$2.5534 \\ \text{FCA} &= \underline{\$153.20} \text{ charge for the month} \end{aligned}$$

In the above example, the City would receive a credit in diesel fuel charges of \$153.20 for the previous month based on 2,000 gallons of fuel (note: fuel volume of 2,000 gallons is for example only).

Example 2:

Assume Q = 2,000 gallons of fuel

CFP (Avg. of high and low prices per State Contract) = \$3.1000 per Gal

Established BFP = \$2.5534 per Gal

CFP/BFP = (1.21); since 1.21 > 1.10 use Eqn. (1)

$$\begin{aligned} \text{FCA} &= [(\text{CFP/BFP}) - 1.10] \times Q \times \text{BFP} \\ &= [1.21 - 1.10] \times 2,000 \times \$2.5534 \\ \text{FCA} &= \underline{\$582.52} \text{ charge for the month} \end{aligned}$$

In the above example, the Contractor would receive additional compensation in diesel fuel charges of \$582.52 for the previous month based on 2,000 gallons of fuel (note: fuel volume of 2,000 gallons is for example only).

Example 3:

Assume Q = 2,000 gallons of fuel

CFP (Avg. of high and low prices per State Contract) = \$2.6400 per Gal

Established BFP = \$2.5534 per Gal

CFP/BFP = (1.03); since 0.90 < 1.03 < 1.10, there is no FCA.

D. The following changes are made to the Project Specifications:

Item 1 Section 01220, Measurement and Payment, Pay Item No. 13 - Manhole Precast Concrete Riser Ring is replaced with the following:

Pay Item No. 13 – Manhole Precast Concrete Riser Ring

Measurement for Manhole Precast Concrete Riser Ring shall be measured from the top of the precast riser to the bottom of the frame, on a per Each basis.

Price and Payment for Manhole Precast Concrete Riser Ring shall be paid for at the unit price per Each, complete in place, and shall include all labor, material, and equipment necessary to adjust the height of the manhole frame and cover by inserting a precast concrete riser ring on top of the manhole and sealing the joint with mastic and non-shrink grout as well as installation of the external grade/riser sealant.

Item 2 Section 01220, Measurement and Payment, Pay Item No. 25 – Temporary Rerouting of Crane Creek is replaced with the following:

Pay Item No. 25 – Temporary Diversion of Crane Creek

Measurement for Temporary Diversion of Crane Creek in the easement shall be paid as a Lump Sum quantity.

Price and Payment for Temporary Diversion of Crane Creek shall be made based on the unit price of Lump Sum. Payment shall be full compensation for furnishing, installing, operating, maintaining and removal of the necessary diversions, flow barriers, sheeting, shoring and bracing, erosion and sedimentation, channels, drains, sumps, coarse aggregate pumps and piping, sheeting, shoring and bracing, restoration and clean-up and for all labor, equipment, tools, materials, and all other items necessary and incidental to the completion of the work.

- Item 3** Section 01220, Measurement and Payment, Pay Item No. 30 - Demolition and Removal of Existing Pump Building is replaced with the following:
Pay Item No. 30 – Demolition and Removal of Existing Pump Building

Measurement for Demolition and Removal of Existing Pump Building shall be measured as a Lump Sum quantity.

Price and Payment for Demolition and Removal of Existing Pump Building shall be made based on the unit price of Lump Sum. Payment shall be full compensation for lead and asbestos survey of the existing structure, additional testing (as needed), demolition and removal existing pump station structure, erosion and sedimentation, hauling and disposal of material, grading, restoration and clean-up and for all labor, equipment, tools, materials, and all other items necessary and incidental to the completion of the work.

- Item 4** Section 01220, Measurement and Payment, Pay Item No. 32.0 - Riprap (SCDOT Type C) is added after Pay Item No. 31.0 – Removal and Disposal of Unsuitable Material:

Pay Item No. 32 – Riprap (SCDOT Type C)

Measurement for Riprap (SCDOT Type C) shall be measured by Cubic Yard as applicable, complete, and accepted.

Price and Payment for Riprap (SCDOT Type C) shall be made based on the unit price per Cubic Yard. Payment shall be full compensation for furnishing and placing riprap protection as specified or directed and includes preparing slopes, excavating the footing trench; geotextile fabric (SCDOT Type 2 Unprotected); and all other items necessary and incidental to the completion of the work.

- Item 5** Section 01220, Measurement and Payment, Pay Item No. 33.0 – Precast Reinforced Concrete Vault is added after Pay Item No. 32.0 – Riprap (SCDOT Type C):

Pay Item No. 33 – Reinforced Concrete Vault

Measurement for Reinforced Concrete Vault shall be made per actual number of Reinforced Concrete Vaults and top slabs satisfactorily furnished and installed to the required depth. Depth shall be measured to the nearest one-tenth (0.10) of a foot, from invert of the outlet pipe vertically to the top of the top of the concrete structure below any risers.

Measurement for Reinforced Concrete Vault shall be measured by the unit of the various sizes.

Price and Payment for each Reinforced Concrete Vault shall be for Each Reinforced Concrete Vault. Payment shall be also made for integral base and cost of all necessary excavation, shoring and bracing required to maintain excavation in a safe condition, aggregate bedding and backfill, native and select material backfilling, pipe-to-vault connector, precast flat-slab top, protective interior coating, flexible rubber boot with clamp assembly, protective exterior coating, SCDOT Aggregate No. 57, at Sanitary Sewer Manhole No. 2 plug 54” DIP with brick and mortar, non-woven geotextile fabric, and provide a complete and operable reinforced concrete vault.

- Item 6** Section 03480, Precast Reinforced Concrete Vault – This Section is added after Section 02778, MACP Database Template Description. See Attachment 2 to this Addendum for full text.

Item 7 Section 11307, Temporary By-pass Pumping System, Part 1, Paragraph 1.2, Subparagraph A that begins with the words "Referenced manufacturer of temporary bypass" is replaced with the following:

- A. Referenced manufacturer of temporary bypass pumping system is Godwin Pumps of America, a Xylem Brand, and is named to establish a standard of quality. Equivalent pumps of other manufacturers may be substituted, following contract award, on written approval of the Owner's Representative.

Requests for substitution shall include manufacturer's literature for each pump and appurtenances giving the name, product number, generic type, descriptive information, and certified test reports showing results to equal the performance criteria of the products specified herein. No request for substitution shall be considered that will yield a lower level of pump performance.

Any material savings shall be passed to the Owner in the form of a contract dollar reduction.

Item 8 Section 11307, Temporary By-pass Pumping System, Part 1, Paragraph 1.5," SURCHARGE IN THE GRAVITY SEWER" is added after Paragraph 1.4 "JOB CONDITIONS":

1.5 SURCHARGE IN THE GRAVITY SEWER

The Contractor's bypass pumping method shall not incorporate surcharging of the gravity sewer to achieve required suction head.

E. The following changes are made to the Project Plans:

There are no changes to the Project Plans.

F. Response to Questions Received from Bidders:

Question 1:

Is coating required for the 60" and 72" steel casing pipe?

Answer: The application for occupancy that the City of Columbia submitted to the Norfolk and Southern Corporation indicated that that the steel pipe to be used as a casing pipe would be coated with coal tar epoxy. The Norfolk and Southern Corporation approved the application as submitted. For purposes of uniformity, all steel casing pipe used on this project is be coated with coal tar epoxy.

Question 2:

Special Provision 4.5 requires the contractor to submit experience showing 10,000 lf of gravity sewer line. Can this requirement be satisfied utilizing the experience of a subcontractor performing the work for a properly licensed WL contractor bidding the work?

Answer: No; the requirement stands as written.

Question 3:

Has a lead and asbestos survey been performed on the pump building? If no, will all lead and asbestos surveys and remediation be handled by way of change order?

Answer: No. In this Addendum refer to above **Part D, The following changes are made to the Project Specifications, Item 1.**

Question 4:

Regarding the gravity sewer from the railroad to the Park, can it be laid backwards, "downhill."

Answer: The City is willing to consider a request from the selected contractor to lay pipe from a higher elevation to a lower elevation. The contractor must sufficiently demonstrate to the satisfaction of the City that by laying the pipe in such a proposed manner will not affect the timely completion of the project nor affect the performance of the system. Recall that in the Special Provisions, Paragraph 3.3 – Sequence of Work, subparagraph 3.3 states that “The Contractor’s work sequence shall be approved by the Owner’s Representative; however, this shall in no way affect the responsibility of the Contractor.”

Question 5:

Can you provide the Owner's bypass pump information? Cutsheets, etc.

Answer: Refer to Addendum No. 1 Part 5, Item 5 (page 4 of 5).

Question 6:

Does the bypass have to be manned 24 hrs/day or can an autodialer be sufficient?

Answer: The contractor shall physically inspect the operation of the temporary bypass pump station and force main:

1. Two times per day (once in the morning and once in the evening), Monday through Friday;
2. One time per day, on Saturdays and Sundays; and,
3. As needed during wet weather conditions and other extraordinary conditions.

The status of the pump station and force main shall be recorded in an inspection log which is to be kept at the pump station site.

The temporary bypass pumping station and force main shall be provided with a continuous auto-dialer wireless alarm monitoring and notification system with floats and alarm at the pump station (e.g., levels of flow, pump status, and discharge pressure). An auto dialer shall notify the contractor in the event of a malfunction or disruption in-service with the pumps at the pump station.

The auto-dialer shall be operational 24 hours per day, 7 days per week, 365 days a year, for the time that the temporary bypass pumping system is in operation.

Within one hour of the auto-dialer notifying the contractor, including holidays and weekends, a representative of the contractor shall be on-site to address the emergency.

Question 7:

Are any written details or drawing available depicting the Crane Creek Diversion?

Answer: No. The contractor is to be solely responsible for planning and executing the diversion of waters in Crane Creek.

Question 8:

Are the locations of the jack and bores guaranteed?

Answer: The horizontal and vertical alignments of the 48" gravity sewer have been established by field survey grade information and the best available information. Agencies having jurisdiction over different parts of the project have awarded to the City permits to construct the improvements as shown on the Plans. Easements have been acquired from property owners.

Question 9:

Special Provision 17.3.7 paragraph 3 states "If the material can be placed on the surface and suitably dried prior to incorporation in the work the material may be considered by the Owner's Representative to be suitable for use."

1. Please provide criteria and measurement for "suitably" drying and how this will be verified.
2. What will the Owner allow?

Answer: In the context of the question "suitable for use" means that the moisture in the soil is within 2% of the optimum water content in accordance with ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³ (600 kN-m/m³

Question 10:

Please confirm all required permits are obtained; DOT, Railroad, etc.

Answer: The City has in its possession all permits to construct improvements from agencies having jurisdiction over the project except for the US Army Corps of Engineers, Nationwide 13 and from Richland County a letter regarding land disturbance.

Question 11:

Can the bid opening be delayed one week?

Answer: The City of Columbia will not consider a request to reschedule the date of bid opening.

Question 12:

In the event of site flooding, will the city of Columbia provide the contractor an area for equip, material, dirt spoils, etc. to be stored? Will bypass pumping expense be paid by the city? Will the owner consider paying for flood delays?

Answers: No. The contractor is responsible for gaining access to property which is capable of satisfying his various project needs.

All expenses associated with the temporary by-pass pumping system are to be borne by the contractor. The contractor may pose to the City for its consideration a daily rate of expenditure to operate the temporary by-pass pumping system. This daily rate is to be based upon the aggregate hours of pump usage and fuel and oil consumption per unit over a prescribed unit of time.

The City of Columbia will not pay for any delays in time resulting from flooding of the project area. However, under the proper circumstances, the City may be receptive to a request for extending the time to the contract. This topic may be presented to the City for discussion at the completion of the project.

Question 13:

Please provide a detail for the temp. piping support over crane creek. Aerial detail?

Answer: It is left to the contractor to devise a means of supporting the temporary by-pass force main as it crosses above Crane Creek capable of vertical movement and thermal elongation.

Question 14:

What station is the separation between “crane creek bypass” and “smith branch bypass” ?

Answer: The expectation is that wastewater conveyed by the Crane Creek temporary by-pass force main and the Smith Branch temporary by-pass force main will discharge into the receiving gravity sewer at a common point. The contractor is responsible for dividing the bypass flows between the two temporary bypass systems.

Question 15:

Does the City have a fee attached to the treatment and disposal of contaminated groundwater? Existing landfill material to be hauled away?

Answers: The City has no fee associated with the treatment and disposal of groundwater should it be determined that samples collected at certain locations indicate that the groundwater is contaminated. However, in addition to the testing for the analytical parameters cited in the Special Provisions, Section 2.0, Paragraph 1, subparagraph 12, testing of BOD and TSS will be required to confirm that the discovered levels fall within the limits of the City’s Sewer Ordinance criteria for domestic wastewater.

The City has no fee associated with the loading, hauling, dumping or any other costs associated with properly disposing of existing landfill material. It is the contractor’s responsibility to dispose of such material at no additional cost and without the aid of the City staff or services.

Question 16:

Is the quantity for pay item no. 17.1 the bedding stone for all of the pipe?

Answer: Yes.

Question 17:

Please provide a “Trench Cap (1’ thick)” detail.

Answer: Refer to the Plans, Pipe Bedding Detail, Sheet 14 of 15.

Question 18:

Pay item 20.0, spec says to fill mh's with flowable fill while the detail on the plans says to use sand. Which should we price?

Answer: Manholes to be abandoned are to be filled with flowable fill.

Question 19:

Please clarify contractors insurance requirements. Can not locate requirements (page InB-9, Item 20.5)in the specifications.

Answer: Refer to the following:

City of Columbia Engineering Regulations, Part 14: Instructions to Bidders, Paragraph 14.21
(web address: <http://www.columbiasc.net/depts/utilities-engineering/docs/engregs/engreg14.pdf>)

Question 20:

Bid item 20- Fill & Abandon Sewer manhole with flowable fill—section 2.0-F calls for Type a3 sand. Are they to be filled with sand or flowable fill?

Answer: For answer refer to Question No. 18.

Question 21:

2.0e—Do you really want non excavatable flowable fill to be used to fill existing lines?

Answer: Yes.

Question 22:

St. 0+20 –The new manholes has a 20 foot stub out with a brick and mortar plug. You may want to look at a better plugging option? This may blow out with any pressure.

Answer: At Sanitary Sewer Manhole No. 2 the contractor is to seal the opening of the 54" pipe with brick and mortar. The brick and mortar shall extend into the pipe for at least 12 inches, forming a solid waterproof plug completely bonded to the pipe. The contractor is to insert the downstream end of the 54" pipe no more than 6" into a precast concrete vault.

The stub-out shall be accurately referenced to the center of Sanitary Sewer Manhole No. 2, and the actual invert elevation of each end of the stub out shall be accurately recorded on the As-Built drawings.

Question 23:

The groundwater sampling wells are to be installed on centerline. This cannot be done without damaging the existing pipe. How will the wells need to be closed out after construction? Per DHEC requirements?

Answer: All ground water sampling locations must be permanently abandoned in accordance with SC Department of Health and Environmental Control, Regulation R61-71, Paragraph H.

Question 24:

Page 5 Special Provisions require that the tankers/containment trucks remain on site and await disposition. How long will this take? These trucks and tankers will have to be rented and they are expensive.

Answer: In this Addendum, see Part C Changes to the Project Special Provisions, Item 2.

Question 25:

Will the by pass pumping system require Employees of the contractor on site around the clock monitoring.

Answer: For answer refer to Question No. 6.

Question 26:

Due to the difficulty of these bores, should the boring contractor also show qualifications of past experience in rock and tunnel bores in wet conditions?

Answer: No. The City is satisfied with its current requirements.

Question 27:

SP 17.3.3- Use of Explosives—Shouldn't this section meet the requirements of ATF and the State Fire Marshal Code?

Answer: The contractor shall comply with the requirements of the agency having jurisdiction over the project.

Question 28:

Bid Item 25- Reroute Crane Creek –Crane creek is in the wetlands area, only 20 feet can be disturbed per the permit. How can this be done?

Answer: Crane Creek is separate and distinct from the wetlands. Activity at and across Crane Creek is limited to the width of the adjoining permanent easement.

Crane Creek is not be realigned. The waters of Crane Creek are to be temporarily diverted.

Question 29:

Can the Corp of Engineer Wetlands permit be provided for review prior to the bid?

Answer: If the US Army Corps of Engineers releases the approved Nationwide 12 permit prior to the date of bid opening, it will be made available to all bidders via bid-online.

Question 30:

Ex. Pump Building—Has a lead and asbestos survey of the building been done?

Answer: No. The contractor is to be responsible for the preparation of surveys for lead and asbestos. See answer to Question 3.

Question 31:

How do we access the Existing Pump station to be demolished?

Answer: The contractor can access the former pump station building from the 50' wide permanent sewer easement over the 36" gravity sewer.

Question 32:

SP 36.2- If contractor follows the SWPPP plan as designed, and the City is fined, how can these fines be the contractors fault and therefore deducted from the Contractor?

Answer: If the contractor complies with the requirements of the Stormwater Pollution Prevention Plan (SWPPP), the City does not anticipate any fines. The contractor is reminded that the SWPPP establishes a standard level of care. As conditions change on site, it may be necessary for the contractor to elevate the standard of care.

Question 33:

In order to be able to perform low pressure air test on the Manholes and Lines, we will have to install blow up plugs in the manholes. The blow up plugs for that size line are too large to fit inside a 4' diameter Manhole. What do you propose?

Answer: It is our understanding that 48" plugs can be fit inside the manhole. Therefore, the expectation is that the acceptance testing will occur just as planned.

Question 34:

SP 47.2- Is there an estimate from the Rail Road on the cost to the contractor for insurance?

Answer: We have no knowledge of the existence of such an estimate. The contractor is especially encouraged to read the agreement between the Norfolk and Southern Corporation and the City of Columbia, Paragraph 11 Insurance.

Question 35:

SP 47.4- The City is paying for the R/R flagman for 5 days during construction. We don't think that will be enough time. Will the City consider extending that to 15 days? If not what is the cost per day for the Flagman?

Answer: The City will pay all costs for the services of a railroad flagman for no more than 15 consecutive days. The cost for the flagman is established by the Norfolk and Southern Corporation at the time the bore and jack is initiated.

Question 36:

By Pass Pumping Section 11307 1.2H—What will contractor need from DHEC?

Answer: The City's opinion is that the contractor will not need to acquire any item from the SC Department of Health and Environmental Control (SCDHEC) in order to operate the temporary by-pass pumping system. The City does strongly recommend notification of SCDHEC prior to putting the system in operation.

Question 37:

By Pass Pumping 1.3 17-18—Does this include contractor employees onsite 24hrs a day 7 days a week?

Answer: For answer refer to Question No. 6.

Question 38:

By pass Pumping 2.1C—Are the City pumps in operation condition? IF the City Pumps have an mechanical failure beyond general maintenance, who is responsible for the repairs?

Answer: Refer to Addendum No. 1, Part 5, Item 5 (page 4 of 5).

Question 39:

By Pass Pumping 2.2 I&J—Are you sure that 24/7 contractor personnel on site is not required?

Answer: See answer to Question No. 6.

Question 40:

By Pass Pumping 2.2 J—How often are the signs required?

Answer: Signs are to be erected at all points of public access. It is left to the discretion of the contractor where these points of public access are located, but at a minimum, the contractor shall erect 6 signs.

Question 41:

SP 17.3.3.7.3 – Trench width minimum due to this spec will be 8 feet minimum. Based on a maximum of 20 feet working area in the wetland this will create a safety hazard. How can this be constructed and still meet OSHA guidelines?

Answer: In wetlands the 20 foot wide corridor of land disturbance is unchangeable. The contractor is to satisfy himself on how to best cross the wetlands without compromising safety.

Question 42:

SP 25.3—Rip Rap –It states that Rip Rap will be paid by unit price. No unit price item is provided in the bid form?

Answer: The pay item is now included in the revised Proposal Bid for Unit Price Contracts attached to and made a part of this Addendum 2.

Question 43:

SP 46.3—Can inspections be done as the construction advances? Cost to by pass pump can drag out several months if we wait to the end of construction to begin inspections.

Answer: Yes. The contractor is reminded that the Special Provisions, Paragraph 3.0 Scope of Work, subparagraph 3.3 states that “The contractor’s work sequence shall be approved by the Owner’s Representative.”

Question 44:

SCDOT Permit expires on June 18, 2015. Have you requested an extension?

Answer: The City of Columbia has requested a time extension to the SCDOT encroachment permit.

Question 45:

02604 1.6 Warranty—Manhole Linear – It is our understanding that the Linear manufacture will not provide a 10 year warranty. What do you propose?

Answer: Agru America, the manufacturer of the liner proposed for use, offers a limited warranty on its material for a period of 10 years, prorated from the final ship date, when subsequently properly installed and used in a buried application. Acquire the limited warranty.

Question 46:

02606 Exterior Manholes 2.d – states that all coatings shall be field painted. Section 3.7 states that the coatings to be done at the factory. The Manufacture typically applies this at the factory. How do you want it done?

Answer: The protective coating is to be applied to the exterior surfaces of the precast concrete pieces at the factory where the precast concrete pieces are made. The applying of a protective coating to the concrete benches and inverts in manholes is to occur in the field.

Question 47:

Pay Item 25—you only have a 20 ft of disturbance easement inside the wetlands. how do you propose we install and remove necessary diversions, flow barriers,, sheeting, shoring and bracing, erosion and sedimentation control, channels, drains, sumps, coarse aggregate pumps and piping, etc. inside a 20 ft area?

Answer: See answer to Question No. 41.

End of Addendum 2



Joseph D. Jaco, P.E.
Director, Department of Utilities and Engineering

CIP PROJECT #: SS695401 (Revised 2-15-2015)
48" SANITARY SEWER INTERCEPTOR REPLACEMENT ALONG BROAD RIVER AND CRANE CREEK

DO NOT CHANGE ANY ITEM DESCRIPTION ON THESE SHEETS UNLESS YOU ARE DIRECTED TO BY
 ADDENDUM. IN THE EVENT THE CONTRACTOR MAKES ANY CHANGES, THE BID WILL NOT BE READ
 PUBLICLY AND THE PROPOSAL WILL BE REJECTED AND NOT CONSIDERED.

Base Bid Items

<u>Pay Item</u> <u>No.</u>	<u>Item</u>	<u>Estimated</u> <u>Quantity</u>	<u>Unit</u>	<u>Unit Price (\$)</u>	<u>Extension (\$)</u>
1.0	Preparation of Plans:				
1.1	Health and Safety Plan	1	LS	_____	_____
1.2	Trench and Excavation Plan	1	LS	_____	_____
1.3	Emergency Action Plan (Flood Plan)	1	LS	_____	_____
1.4	By-Pass Pumping Plan	1	LS	_____	_____
1.5	Spill Response Plan	1	LS	_____	_____
2.0	Mobilization (Maximum 5% of Bid)	1	LS	_____	_____
3.0	Clearing and Grubbing	1.0	LS	_____	_____
4.0	Implement Stormwater Pollution Prevention Plan (SWPPP)	1	LS	_____	_____
5.0	Special Dewatering	1,000,000	Gal	_____	_____
6.0	Ductile Iron Pipe Gravity Sewer				
	<u>8" Diameter (Open Trench)</u>				
6.1	0'-6' Deep	100	LF	_____	_____
6.2	6.1'-8' Deep	25	LF	_____	_____
6.3	8.1'-10' Deep	105	LF	_____	_____
6.4	10.1'-12' Deep	65	LF	_____	_____
6.5	12.1'-14' Deep	120	LF	_____	_____
	<u>48" Diameter (Open Trench)</u>				
6.6	0'-6' Deep	75	LF	_____	_____
6.7	6.1'-8' Deep	1,297	LF	_____	_____
6.8	8.1'-10' Deep	1,088	LF	_____	_____
6.9	10.1'-12' Deep	2,373	LF	_____	_____
6.10	12.1'-14' Deep	1,816	LF	_____	_____
6.11	14.1'-16' Deep	196	LF	_____	_____
6.12	16.1'-18' Deep	25	LF	_____	_____
	<u>48" Diameter, Restrained Joint</u>				
6.13	Carrier Pipe Installed in Steel Casing	789	LF	_____	_____

<u>Pay Item No.</u>	<u>Item</u>	<u>Estimated Quantity</u>	<u>Unit</u>	<u>Unit Price (\$)</u>	<u>Extension (\$)</u>
6.14	<u>54" Diameter (Open Trench)</u> 12.1'-14' Deep	20	LF	_____	_____
7.0	Precast Concrete Manhole (5' diameter)				
7.1	10.1' - 12' Cut	1	EA	_____	_____
8.0	Precast Concrete Manhole Base (Type J)				
	<u>8' Diameter</u>				
8.1	6.1' to 8' Cut	5	EA	_____	_____
8.2	8.1' - 10' Cut	5	EA	_____	_____
8.3	10.1' - 12' Cut	9	EA	_____	_____
8.4	12.1' -14' Cut	3	EA	_____	_____
8.5	14.1' -16' Cut	2	EA	_____	_____
8.6	16.1' -18' Cut	1	EA	_____	_____
	<u>10' Diameter</u>				
8.7	10.1' - 12' Cut	1	EA	_____	_____
8.8	12.1' -14' Cut	1	EA	_____	_____
9.0	Precast Concrete Manhole Base (Doghouse)				
	<u>10' Diameter</u>				
9.1	12.1-14' Cut	1	EA	_____	_____
10.0	Extra Depth Manhole (4' Dia.)	386	VF	_____	_____
11.0	Manhole Precast Concrete Top Slab (4' Dia.)	29	EA	_____	_____
12.0	Outside Drop Connection for Precast Manhole	2	EA	_____	_____
13.0	Manhole Precast Concrete Riser Ring	29	EA	_____	_____
14.0	Manhole Vent Stack	9	EA	_____	_____
15.0	Removal and Disposal of Excess Material Excavated from Landfill Zone	4,729	CY	_____	_____
16.0	Temporary By-Pass Pumping System				
16.1	Crane Creek Interceptor and Barony Gravity Sewer	1	LS	_____	_____
16.2	Smith Branch Interceptor	1	LS	_____	_____

<u>Pay Item No.</u>	<u>Item</u>	<u>Estimated Quantity</u>	<u>Unit</u>	<u>Unit Price (\$)</u>	<u>Extension (\$)</u>
17.0	Select Material				
17.1	SCDOT Aggregate No. 57	6,370	TN	_____	_____
17.2	Trench Cap (1' Thick)	4,466	SY	_____	_____
17.3	Suitable Material (Borrow)	500	CY	_____	_____
18.0	Connect to Existing Manhole	1	EA	_____	_____
19.0	Seal and Fill 36" Pipeline with Flowable Fill	7,456	LF	_____	_____
20.0	Fill and Abandon Sewer Manholes with Flowable Fill	24	EA	_____	_____
21.0	CCTV Inspection of Sewer Pipeline				
21.1	8" Sewer	355	LF	_____	_____
21.2	48" Sewer	7,550	LF	_____	_____
22.0	Preconstruction Video Taping	1	LS	_____	_____
23.0	Major Manhole Height Adjustment	10	VF	_____	_____
24.0	Jack and Bore				
24.1	72" Dia. Steel Pipe Casing Pipe Beneath Interstate 20	324	LF	_____	_____
24.2	72" Dia. Steel Pipe Casing Pipe Beneath Railroad	216	LF	_____	_____
25.0	Temporary Diversion of Crane Creek	1	LS	_____	_____
26.0	Steel Casing Pipe (Open Cut) (60" Diameter)	140	LF	_____	_____
27.0	Concrete Pipe Anchor	51	EA	_____	_____
28.0	Anti-Seep Collar	7	EA	_____	_____
29.0	Rock Excavation	1,023	CY	_____	_____
30.0	Demolition and Removal of Existing Pump Building	1	LS	_____	_____
31.0	Removal and Disposal of Unsuitable Material	500	CY	_____	_____
32.0	Riprap (SCDOT Type C)	550	CY	_____	_____

<u>Pay Item No.</u>	<u>Item</u>	<u>Estimated Quantity</u>	<u>Unit</u>	<u>Unit Price (\$)</u>	<u>Extension (\$)</u>
33.0	Precast Reinforced Concrete Vault Size: 6' x 6'	1	EA	_____	_____
*Total Base Bid/ Bid Online Total:					_____

Dollars _____ Cents _____

(Indicate the Total Base Bid/Bid Online Total above in both figures and words, In case of discrepancy, the amount shown in words will govern.)

Owner's Contingency: _____ \$1,500,000.00

****Total Bid Proposal Amount (Base Bid with Owner's Contingency)** _____

Dollars _____ Cents _____

(Indicate the Total Bid Proposal Amount (Base Bid with Owner's Contingency) Total above in both figures and words, In case of discrepancy, the amount shown in words will govern.)

* Total Base Bid / Bid Online Total - The Bid Bond for this project should be based on the total base bid amount listed above and on the bid online system.

** Total Bid Proposal Amount - The performance and payment bond should be based on the total bid proposal amount listed above.

Alternate Bid No 1

A1-1	Precast Concrete Manhole Base (Centered Tee)				
A1-1.1	6.1' to 8' Cut	5	EA	_____	_____
A1-1.2	8.1' - 10' Cut	5	EA	_____	_____
A1-1.3	10.1' - 12' Cut	10	EA	_____	_____
A1-1.4	12.1' -14' Cut	4	EA	_____	_____
A1-1.5	14.1' -16' Cut	2	EA	_____	_____
A1-1.6	16.1' -18' Cut	1	EA	_____	_____
A1-2	Deduct Pay Item No. 8	27	EA	_____	_____

Alternate Bid No 1 Total: _____

Dollars _____ Cents _____

(Indicate the Total Base Bid/Bid Online Total above in both figures and words, In case of discrepancy, the amount shown in words will govern.)

BASE BID EQUIPMENT MANUFACTURERS AND SYSTEM SUPPLIERS:

The project will be awarded based on the base bid equipment listed below. The bidder must base his lump sum portion of the bid on the listed base bid equipment manufacturers/suppliers. Deductions for Owner selected equipment substitutions will not be considered in determining the bases of award. The bidder may indicate substitute equipment manufacturers/suppliers items by writing in the substitute manufacturer/supplier and the amount of the deduction for that substitute name write-in.

Substitute manufacturer/supplier will be deemed as equal if the substitute is the same or better than the product named and described in specifications in function, performance, reliability, quality and general configuration. Determination of the equality of a substitute shall be determined by the Owner after the bid, based on submittal data received with the Contractor's bid documents. Should the write-in substitute be determined "not equal", then the bidder shall supply the equipment by the listed base bid manufacturer/supplier. The Owner may determine any substitute "not equal" as Owner determines to suit his sole best interest at any time.

Evaluation data to determine if a substitute equipment manufacturer/supplier is an acceptable substitute must be submitted by the bidder with the bid. Information submitted after the bid will not be considered. Information submitted directly by equipment manufacturers/suppliers will not be evaluated. Minimum evaluation data shall include submittal information in conformance with Section 11307, Temporary By-pass Pumping System of the Contract Documents. Sales catalog cuts or marked up drawings from previous projects will not be reviewed. The Owner is in no way obligated to review substitute equipment submittals.

No substitute equipment/manufacturer/supplier will be considered unless, in the opinion of the Owner, it conforms to the Contract Drawings and Specifications in all respects, except for the make and manufacture and minor details. Design and preparation of these plans and specifications are based on equipment by the listed manufacturers/suppliers. The bidder shall also include any and all costs associated with additional construction costs (mechanical, structural, electrical, architectural, engineering, construction observation, etc.) as the result of a substitute item. The bid shall also include any paid up licenses necessary for the use of the equipment as required.

Base Bid Manufacturer and System Supplier Schedule				
Spec Section	Description	Base Bid	Substitute	Deduction Amount for Substitute
11307	Temporary By-pass Pumping System	Godwin Pumps of America, a Xylem Brand		

SECTION 03480

PRECAST REINFORCED CONCRETE VAULT

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This section includes all labor, materials, tools, equipment, services, and incidentals necessary to furnish and install precast reinforced concrete vault to be located at the downstream end of a 54" ductile iron pipe stub-out which originates at sanitary sewer manhole no. 2. The 54" ductile iron pipe is to penetrate through the wall of the vault. A precast vault put to this type of use is sometimes referred to as a "blind box."
- B. The precast reinforced concrete vault is not to be provided with frame and cover, steps, ladder, hatch cover assembly, benchwalls and inverts or sump.
- C. All interior and exterior surfaces of the vault are to be coated in accordance with the materials identified in this Section.

1.2 RELATED SECTIONS

- A. Related Specification Sections include, but are not necessarily limited to:
 - 1. PART 17 – Specifications for Sanitary Sewers
 - 2. Special Provisions

1.3 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by basic designation only.
 - 1. American Association of State Highway Transportation Officials (AASHTO):
 - a. AASHTO HS20-44 Standard Design Loading for Highway Structures
 - 2. American Concrete Institute (ACI):
 - a. ACI 318 (2008) Building Code Requirements for Structural Concrete and Commentary
 - b. ACI 350R, (2006) Code Requirements for Environmental Engineering Concrete Structures
 - 3. American Society for Testing and Materials (ASTM)

- a. ASTM C94 (2007) Standard Specification for Ready-Mixed Concrete
- b. ASTM C150 (2007) Standard Specification for Portland Cement
- c. ASTM C478 (2008) Standard Specification for Precast Reinforced Concrete Manhole Sections
- d. ASTM C497 (2014) Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile
- e. ASTM C857 (2014) Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures
- f. ASTM C890 (2013) Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures
- f. ASTM C913 (2008) Standard Specification for Precast Concrete Water and Wastewater Structures
- g. ASTM C 923 (2008) Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals
- h. ASTM C 990 (2000) Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

1.4 SUBMITTALS

- A. Certification and Sampling: The Contractor shall furnish certificates stating that materials supplied conform to the requirements of these Specifications. The certifications shall include or have attached, results of tests for the specified properties.
- B. Certificates shall be signed by the Contractor.
- C. Submittals shall be made within 30 days prior to beginning use of reinforced concrete vaults. .
- D. Submit the following in accordance with the Conditions of the Contract Documents:
 - 1. SD-01, Data:
 - a. Vault materials: Cut sheets, for standard precast units, showing conformance to the drawings and requirements, and to applicable industry design standards listed in this specification.

- b. Embedded items: Product data sheets and proper installation instructions for anchors, lifting inserts, and other devices. Clearly indicate the product dimensions and safe working load.
 - c. Accessories: proper installation instructions and relevant product data for items including, but not limited to, sealants and gaskets, and other items installed before or after delivery.
 - d. Submit manufacturer's catalog data on precast concrete items. Show dimensions of vault and location of openings including thicknesses of walls, floor and top slab. Show reinforcing wire and steel. Show materials of construction by ASTM reference and grade.
2. SD-04, Drawings:
- a. Drawings for standard precast units furnished by the concrete producer for approval by the Owner's Representative. These drawings shall demonstrate that the applicable industry standards have been met. Include installation and construction information on shop drawings. Include details of steel reinforcement size and placement as well as supporting design calculations, if appropriate. Produce precast concrete units in accordance with the drawings.
3. SD-10, Test Reports:
- a. Test Reports:
 1. Copies of material certifications and/or laboratory test reports, including mill tests and other test data for Portland cement, blended cement, pozzolans, ground granulated blast furnace slag, silica fume, aggregate, admixtures, and curing compound proposed for use on this project.
 2. Copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified and will be suitable for the job conditions. Such tests may include compressive strength, flexural strength, plastic or hardened air content, freeze thaw durability, abrasion and absorption. Clearly detail in the Specifications special test for precast concrete or cast-in items,
 3. Copies of in-plant Quality Assurance/Quality Control inspection reports, upon the request of the Engineer.
4. SD-12, Field Test Reports:
- a. Tests and inspection reports, as specified
5. SD-13, Certificates:
- a. Portland cement: Certificates of compliance stating that the type of cement used in the manufacture of precast concrete manholes
 - b. Submit manufacturer's design calculations and certification signed and sealed by a professional registered in the State of South Carolina that vault design and

construction comply with the specified design load conditions and the referenced ASTM specifications.

1.5 QUALITY ASSURANCE

- A. For this particular project precast concrete sections on the project are to be manufactured in a plant certified in the National Precast Concrete Associations (NPCA) Plant Certification Program.
- B. Precast concrete members shall be designed and manufactured in accordance with the above referenced specifications.
- C. Structural design for precast concrete vault sections shall be signed and sealed by a Professional Engineer, registered in the State of South Carolina. Sealed, signed and dated copies of all such designs shall be submitted to the Owner's Representative for review and approval. Design must be submitted to the Owner's Representative as a submittal for approval; however, the submittal does not relieve the Contractor of his responsibility for the design.
- D. Precast Manufacturer shall provide detailed structural design calculations for precast concrete manhole system sections, which shall include design criteria, calculations for live and dead loads, wall stresses, floatation, depth calculations, joint and reinforcement, and all others necessary for design.
- E. All precast components shall be supplied from a single source precast manufacturer.

1.6 HANDLING, STORAGE, AND DELIVERY

- A. Handling: Handle, transport, and store products in a manner to minimize damage. Lifting devices or holes shall be consistent with industry standards. Perform lifting with methods or devices intended for this purpose as indicate on shop drawings. Inspect materials delivered to site for damage; store with minimum of handling. Store materials on site enclosures or under protective coverings. Store rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of fittings free of dirt and debris.
- B. Storage: Store units off the ground or in a manner that will minimize potential damage.
- C. Delivery: Deliver precast units to the site in accordance with the delivery schedule to avoid excessive build-up of units in storage at the site. Upon delivery to the jobsite, all precast concrete units will be inspected by the Owner or its designee for quality and final acceptance.

PART 2 - PRODUCTS

1.1 PRECAST CONCRETE STRUCTURES

- A. General: the following requirements apply to all precast concrete structures, chambers, and vaults constructed on this project.
1. All precast concrete structures shall be designed by a professional engineer registered in the State of South Carolina. Each drawing for design shall be stamped and signed by the professional engineer.
 2. Precast concrete structures shall be manufactured in accordance with ATM C478, latest revision, and shall be designed for HS-20 Live Load, latest revision.
 3. Precast concrete structures shall be of approved design and sufficient strength to withstand the loads to be imposed upon them. An approved watertight joint shall be provided between precast concrete sections.
 4. Mark date of manufacture and name or trademark of manufacturer on inside of precast concrete chamber section.
 5. All concrete in precast units shall be stone aggregate and develop a strength of 4,000 psi at 28 days and shall conform to the following specifications:
 - a. All concrete furnished and installed for precast concrete vaults shall be in accordance with ACI 318 Code for Reinforced Concrete.
 - b. Materials:
 - 1) Cement: Portland Cement, ASTM C150, Type I or Type II.
 - 2) Admixtures: Admixtures other than air entraining shall not be used. Air entraining admixture shall conform to ASTM C260. Air content of concrete with ¾-inch maximum size aggregate shall be 6 percent plus or minus 1 percent volume.
 - c. Water: Clean and free from injurious amounts of oils, acids, alkalis, organic materials, or other substances.
 - d. Aggregates: aggregates shall conform to ASTM C33, latest revision. Course aggregate shall be size number 67 (nominal ¾-inch to No. 4).
 - e. Proportions of materials in concrete and strength of concrete shall be subject to the following conditions:
 - 1) Minimum 28-day compressive strength – 4,000 psi.
 - 2) Maximum water to cement ration by weight – 0.45.
 - 3) Minimum cement content 600 lbs/cubic yard.
 6. All precast concrete shall be manufactured by wet cast methods only, and shall be approved design.
 7. All precast concrete shall be reinforced. Reinforcing shall be designed for all applicable loads and forces encountered. Steel reinforcing shall be ASTM A 496-A 615 Grade 60-60 KSI.
 8. Acceptable providers of the precast reinforced concrete vault are:
 - a. Model no. WV7272 as manufactured by Tindall Corporation; or,
 - b. Approved equal.

9. Acceptable products for protection of the interior surfaces of the vault and top slab are:

- a. Raven 405 protective liner as manufactured by Raven Lining Systems, Inc.;
- b. Quadex , Inc. Sewer Rehabilitation Products;
- c. Tnemec Series 436 Perma-Shield; or,
- d. Approved equal.

10. Prior to backfilling, all below grade exterior faces of the concrete structures shall be painted with two coats of sealer. Acceptable products are:

- a. Bitumastic 300-M as manufactured by Carboline; or,
- b. Approved equal.

11. The precast concrete vault shall receive exterior joint sealants. Prior to placement of the joint sealer the joint surfaces shall be primed in accordance with the recommendations of the sealer manufacturer. Joints shall be water tight. Upon completion of installation, excess joint sealers shall be trimmed flush with the inside and outside surface of the wet well. If recommended by the manufacturer, heat shall be applied to all areas being sealed.

Exterior Joint sealer tape (use 12 inch wide tape).

Acceptable products are:

- a. Model # CS-300Con-Seal as manufactured by Concrete Sealants, Inc.,
- b. Rub-R-Nek as manufactured by the Henry Company
- c. Wrapid Seals manufactured by Canusa-CPS
- d. Approved equal

2.2 CHAMBER, VAULT, AND MANHOLE CONSTRUCTION DETAILS.

- A. Precast concrete chamber, vault, bases, and manholes shall have monolithic reinforced concrete and shall have a keyway type joint between precast concrete sections.
- B. Joint between precast concrete section shall be sealed as recommended by manufacturer and shall be watertight upon completion of joint. Joints shall be buttered inside and outside with 1 to 2 cement brick sand mortar.
- C. Where the proposed piping passes through exterior walls of precast concrete chambers and vaults, the manufacturer shall provide an oversized opening and mechanical type seal or shall provide an assembly consisting of a flexible rubber boot with clamp assembly. The boot assembly shall meet the requirements of ASTM C-923 and shall have a stainless steel power sleeve and clamps.
- D. The roof slab shall be a minimum of 8 inches thick.

PART 3- EXECUTION

3.1 INSPECTION

A. Precast Section

1. The vault shall be placed on a subbase consisting of SCDOT Aggregate No. 57 placed in 6" lifts. The aggregate is to be compacted to 95% maximum dry density in accordance with ASTM D698. The aggregate shall extend 6 inches beyond the outer wall of the manhole. The SCDOT Aggregate No. 57 is to be wrapped in a non-woven geotextile fabric manufactured in accordance with AASHTO M28, Class 2. For acceptable manufacturers and products refer to SCDOT qualified products list 44.
- B. Lifting holes shall be sealed tight with a solid rubber plug driven into hole and remaining void filled with a mix of 1 part cement and 2 part sand mortar.
- C. All precast concrete structures shall be free from visible leakage: each structure shall be tested for leaks and inspected and all leaks shall be repaired in a manner subject to the approval of the Owner's Representative.

END OF SECTION