



CITY OF DURHAM
Department of Public Works
101 City Hall Plaza | Durham, NC 27701
919.560.4326 | F 919.560.4316

www.durhamnc.gov

DATE: May 4, 2016
TO: Prospective Bidders
SUBJECT: Contract ST-278: Ravenstone and Stonehill Estates Paving 2016
ADDENDUM 3: Update to the Bid Form and answers to questions

This Addendum updates the unit price bid form to add three additional items to reflect the following:

- Addition of Asphalt Base Course - Type B25.0
- Addition of MS4 Inspections
- Addition of Cleaning for MS4 Inspections

The unit price bid table has been replaced in the bid form (Section 00 41 43) and agreement form (Section 00 52 15) in the project manual showing this table.

The modified versions of the unit price bid sheet and the bid form and the specifications to be used for the added line items are attached.

This addendum also answers the following questions:

- **In the project manual, it is stated that the total contract time will be 120 calendar days. Will the City consider allowing more time?**
Yes, The contract time for this project has been increased to 150 days. This addendum changes any related language in the project manual to include Section 00 11 16 and Section 00 52 15 to reflect the change in the number of days for substantial completion of work to 150 days.
- **Will reuse of storm pipes be allowed? Since there is no separate line item for Reused pipe work, How is this work differentiated from the work with new pipes?**
Based on the information available, it is assumed that wherever pipe replacement is required, the pipe material is not re-usable (worst case scenario). So City requires the contractor to use new pipe material for storm pipe replacements. If in the event that it is determined later that some pipe material can be reused, a determination on how to include that will be discussed then and a change order will be discussed if required.
- **Is the contractor required to cover the areas excavated for storm pipe replacements right after putting in the storm pipe and back filling?**

Yes, the areas excavated for storm pipe replacements should be backfilled as soon as possible after the storm pipe work. For portions of sidewalk or curb and gutter, if concrete work cannot be done right away, then the excavated area should at least be temporarily filled with aggregate to avoid unsafe conditions for pedestrians.

- **Is the contractor required to flush out and videotape the storm pipes after the pipe replacement work?**

Yes, The contractor is required to flush out and video tape the areas where pipe replacement work was done. New bid items(#30 and 31) and specifications have been added for this work.

- **What material and depth are to be used for the Pavement structure repair (bid Item # 7)?**

The material to be used is asphalt base course type B 25.0 for patching beneath the 3" asphalt surface course. A new line item has been added for the base course material. Also the maximum depth of patching will be 12".

This addendum, as well as other details specific to the project, is available on the Public Works' project website.

<http://durhamnc.gov/592/2016-Ravenstone-Stonehill-Estates-ST-27>

Please acknowledge receipt of this Addendum in the space provided in the Bid form. Failure to do so may disqualify the Bidder.

Please let me know if you have any questions on or before 11am Monday, May 9, 2016.

Sincerely,



Kitty M. Thomas
Project Manager
919-560-4326 ext. 30218
Kitty.Thomas@durhamnc.gov

ST-278: Ravenstone and Stonehill Estates Paving 2016

No.	Specification Reference	Bid Item Description	Units	QTY	Unit Price	Cost
1	32 12 16	Asphalt Binder for Plant Mix - Grade PG64-22	TON	550		
2	32 12 16	Asphalt Base Course - Type B25.0	TON	1,800		
3	32 12 16	Asphalt Surface Course - Type S9.5B (1.5")	TON	4,065		
4	32 12 16	Asphalt Surface - Type S9.5A (1.5")	TON	2,660		
5	32 12 50	Modified Recycled Base Course (Full Depth Reclamation 12-14")	SY	48,350		
6	32 12 50	Portland Cement for Cement Modified Recycled Base	TON	970		
7	Appendix O	Micro-Surfacing (1/4" thick overlay)	SY	59,110		
8	32 01 18	Pavement Structure Repair (upto depth 12")	SY	2,500		
9	33 01 31/ NCDOT 840	Manhole/Drainage Structure Adjustments	EA	110		
10	33 01 31	Valve and Meter Box Adjustments	EA	80		
11	33 01 31	Valve and Meter Box Frame and Cover Replacement	EA	5		
12	NCDOT 230	Burrow Excavation	CY	2,500		
13	NCDOT 225-4/ 30 11 00	Undercut Excavation	CY	500		
14	Street detail ST-8.0	30" concrete rolled curb and gutter	LF	2,000		
15	Street detail ST-8.0	24" concrete curb and gutter	LF	200		
16	Sidewalk detail	4" concrete sidewalk (5ft wide)	LF	1,500		
17	NCDOT 310	Temporary No Parking Signs (Install and Remove)	LS	1		
18	NCDOT 310	15-inch R.C. Pipe Culvert, Class III (0 to 5-feet)	LF	825		
19	NCDOT 310	15-inch R.C. Pipe Culvert, Class III (5.1 to 11-feet)	LF	240		
20	NCDOT 310	18-inch R.C. Pipe Culvert, Class III (0 to 5-feet)	LF	680		
21	NCDOT 310	18-inch R.C. Pipe Culvert, Class III (5.1 to 11-feet)	LF	100		
22	NCDOT 310	24-inch R.C. Pipe Culvert, Class III (0 to 5-feet)	LF	385		
23	NCDOT 310	24-inch R.C. Pipe Culvert, Class III (5.1 to 11-feet)	LF	35		
24	NCDOT 310	30-inch R.C. Pipe Culvert, Class III (0 to 5-feet)	LF	100		
25	NCDOT 310	30-inch R.C. Pipe Culvert, Class III (5.1 to 11-feet)	LF	100		
26	NCDOT 310	36-inch R.C. Pipe Culvert, Class III (0 to 5-feet)	LF	435		
27	NCDOT 310	36-inch R.C. Pipe Culvert, Class III (5.1 to 11-feet)	LF	100		
28	NCDOT 300	Foundation Conditioning Geotextile	SY	1,200		
29	NCDOT 300	Foundation Conditioning Material	TON	1,000		
30	30 10 00	MS4 Inspections	LS	1		
31	30 10 05	Cleaning for MS4 Inspections	LS	1		
32	NCDOT 1660	Seeding and Mulching	LS	1		
33		Traffic Control	LS	1		
34	00 31 00	Mobilization for Paving(5% Max of Subtotal)	LS	1		
35	30 11 00/ NCDOT 226/800	Mobilization for Storm Pipe Replacement	LS	1		
BID TOTAL:						

DOCUMENT 00 41 43

BID FORM - UNIT PRICE (SINGLE-PRIME CONTRACT)

To: The City of Durham, North Carolina
c/o The City Manager
101 City Hall Plaza
Durham, North Carolina 27701

Date:

Contract: ST-278

Project: Ravenstone and Stonehill Estates Paving 2016

Sites: Throughout Durham

Name of Bidder:

Address of Bidder:

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Phone Number of Bidder:

Contact Person for Bidder:

Phone Number of Contact:

Bidder's North Carolina General Contractor's License Number:

1. OFFER

The undersigned Bidder hereby declares that the names of all persons interested in this Bid as principals appear in the blank spaces hereinafter provided for such purpose, that this Bid is in all respects fair and without collusion, that the Bidder has examined the locations of the proposed Work, the Advertisement, the Instructions to Bidders, the Technical Specifications, SDBE requirements of the Department of EO/EA of the City of Durham, the Contract Documents and bond forms, and the Drawings therein referred to and fully understands the same and agrees and accepts the terms and conditions thereof, that it is understood that the estimated quantities are approximate only and are given for the purpose of comparing Bids upon a uniform basis, and that said estimate shall in no way affect the unit prices for the Work.

The undersigned Bidder hereby agrees to furnish at the Bidder's cost the expense of all the necessary labor, tools, apparatus, machinery, equipment, transportation, and all other things which may be required to fully and properly perform all the terms, covenants, provisions, and agreements of the annexed Contract.

The undersigned hereby agrees to do said Work and furnish said materials as prescribed in the Contract Documents and Technical Specifications, and, according to the Drawings and requirements of the Engineer under said Contract Documents and Technical Specifications, in a first-class manner and to the best of the undersigned's ability at the following unit prices.

Having examined the Site of the Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by the Engineer for the Project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the unit prices listed in this Bid form in lawful money of the United States of America.

We have included the Bid security as required by the Instruction to Bidders.

All applicable federal taxes are included and State of North Carolina taxes are excluded from the unit prices.

All Cash and Contingency Allowances described in Section 01 20 00 - Price and Payment Procedures are included in the Bid Prices.

2. ACCEPTANCE

This offer shall be open to acceptance and is irrevocable, except as required by law, for ninety (90) days from the Bid opening date.

If this Bid is accepted by the City of Durham within the time period stated above, we will:

Execute the Agreement within ten (10) days of receipt of Notice of Award.

Furnish the required bonds within ten (10) days of receipt of Notice of Award.

Commence Work within ten (10) days after receipt of written Notice to Proceed.

If this Bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required bonds, the Bid security shall be forfeited as damages to the City of Durham by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a contract is signed.

In the event our bid is not accepted within the time stated above, the required security deposit will be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

3. CONTRACT TIME

If this Bid is accepted, we will:

Complete the Work in 150 calendar days from Notice to Proceed - Construction.

4. UNIT PRICES

The following are unit prices for specific portions of the Work as listed. The unit price Bid for items in this Contract are for furnishing, installing all items of Work as indicated on the Drawings and Technical Specifications, complete, in place and accepted, per the City of Durham Standards and Specifications, North Carolina Department of Transportation (NCDOT) Standards and Specifications and the North Carolina Department of Environment and Natural Resources (NCDENR) Erosion and Sediment Control Planning and Design Manual. The following is the list of unit prices:

ST-278: Ravenstone and Stonehill Estates Paving 2016						
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33		Traffic Control	LS	1		
34	00 31 00	Mobilization for Paving(5% Max of Subtotal)	LS	1		
35	30 11 00/ NCDOT 226/800	Mobilization for Storm Pipe Replacement	LS	1		
BID TOTAL:						

We agree to diligently perform the Work in accordance with all Contract Documents, to complete such Work within the period as outlined in the Contract, and to begin Work within ten (10) days after receipt of the Notice to Proceed from the Engineer.

5. ADDENDA

The following Addenda have been received. The modifications to the Bidding Documents noted below have been considered and all costs are included in the Bid.

Addendum No....., Dated.....	Addendum No....., Dated.....
Addendum No....., Dated.....	Addendum No....., Dated.....
Addendum No....., Dated.....	Addendum No....., Dated.....

6. APPENDICES

The following Documents will be submitted to the Issuing Office within five (5) days after the Bid opening:

1. SDBE Form E-105 (see Appendix A for blank form and instructions)
2. Non-Collusion Affidavits of all Subcontractors (see Appendix E for blank affidavits)
3. Privilege Licenses of all Subcontractors (contact the City of Durham, Department of Finance, Treasury Management Division, (919) 560-4700 for information on securing privilege licenses)

The following information is included with Bid submission:

1. Bid Form
2. SDBE Forms (see Appendix A for blank form and instructions)
3. Non-Collusion Affidavit of Bidder (see Appendix E for blank affidavits)
4. Bid Security (see Appendix F for blank Bid bond forms)
5. List of Contractor Equipment and Personnel
6. Bidder Safety Record Review (see Appendix K)

7. CONTRACTOR EXPERIENCE

The undersigned Contractor has regularly engaged in contract work of this class for years, and has executed the following work as principal(s):

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.....

.....
List of Contractor's personnel experienced to do this Work including and designating the Superintendent to be in charge of this Work showing the length of their varied experience with this particular Work. The list shall not include Subcontractor personnel.

Name	Experience	Name	Experience
.....
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.....
.....

List of Contractor's equipment in good condition and suitable for completion of this Contract: Contractor must be able to demonstrate ownership of all equipment necessary to complete all portions of the Contract. The list shall not include Subcontractor equipment.

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Please attach additional sheets as necessary to complete the items above.

8. BID FORM SIGNATURES

Refer to Document 00 21 15 for specific Bid form signature requirements for corporations, partnerships, limited liability companies, individuals, or sole proprietorships.

CORPORATION

The Corporate Seal of

.....
(Bidder - print the full corporate name of firm)

.....
(President/Vice President/Authorized Corporate Officer)

(Seal)

was hereunto affixed in the presence of:

.....
(Secretary/Assistant Secretary)

(Seal)

Corporate Address:

.....

.....

.....

.....
(State of Incorporation)

LIMITED LIABILITY COMPANY

.....
(Bidder - print the full name of firm)

.....
(Authorized Firm Member)

(Seal)

was hereunto affixed in the presence of:

.....
(Witness)

(Seal)

Firm Address:

.....

.....

.....

.....
(State of Formation)

INDIVIDUAL OR SOLE PROPRIETORSHIP

.....
(Bidder - print the full name of individual or sole proprietorship)

(Seal)

Individual or Sole Proprietorship Address:

.....

.....

.....

CONTRACT: ST-278 RAVENSTONE
AND STONEHILL ESTATES
PAVING 2016

ENGINEERING SERVICES DIVISION
DEPARTMENT OF PUBLIC WORKS
CITY OF DURHAM, NORTH CAROLINA

JOINT VENTURE

If the Bid is a joint venture, add additional forms of execution for each member of the joint venture in the appropriate manner using the forms from above.

END OF SECTION

SECTION 30 10 00

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) INSPECTIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Unit Price Work – Measurement and payment.
 - 2. Scope of Work.
 - 3. Submittals.
 - 4. References.
 - 5. Definitions.
 - 6. Quality assurance.

- B. Related Sections:
 - 1. Section 30 10 05: Storm Sewer Cleaning
 - 2. Section 30 11 00: Project Special Provisions.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. MS4 Inspections (Location, Condition, and Illicit Discharge Verification):
 - 1. Basis of Measurement: Lump Sum
 - 2. Basis of Payment: Includes the work described in this specification and will be paid as the actual number of hours the Contractor's personnel is actively engaged in performing MS4 inspections. This item includes the inspection of storm sewer system pipelines and structures (basins) at various Project Sites. There is no separate or additional payment for the inspection of storm sewer system structures (basins) as part of this item.

1.3 SCOPE OF WORK

A. MS4 INSPECTIONS

1. Includes all necessary labor, materials, equipment, services, and incidentals involved in the professional and proactive inspection of portions of the MS4 pipeline reaches, and connected storm sewer pipeline reaches, to determine the detailed condition and to collect data of every notable feature, defect, or other important information. Inspection shall be completed in a two step process consisting of (1) Data Collections and (2) Data Review, Reporting, and Delivery.

B. MS4 BASIN INSPECTION

1. Includes all necessary labor, materials, equipment, services, and incidentals involved in the professional and proactive inspection of storm sewer structures (basins) of the MS4 and connected storm sewer systems to determine the detailed condition and to collect data of every notable feature, defect, or other important information. Inspection shall be completed in a two step process consisting of (1) Data Collections and (2) Data Review, Reporting, and Delivery.

1.4 SUBMITTALS

- A. Contractor shall submit an equipment list to the Engineer, in accordance with Section 01 33 00, for approval before commencement of the Work.
- B. Submit to the Engineer, in accordance with Section 01 33 00, MS4 inspection data documenting conditions within the storm sewer. All MS4 inspections shall include the following submittals:
 1. A hard copy summary of all inspection work completed which documents the storm sewer and structures inspected, length inspected, and inspection date(s).
 2. An electronic copy of all finalized collected digital images, video files, reports, and information files shall be placed onto a USB 2.0 compatible hard drive or other media approved by the Engineer for delivery to the City. In addition, an electronic copy of this data shall be archived by the Contractor for a minimum of 5-years after the Project is complete.
 3. Additional information gathered about the storm sewer or basins shall be submitted in an Excel spreadsheet or compatible file format. Each row shall represent an individual pipeline facility ID with the pipeline attributes in columns.
 4. All inspection information for each Project Site shall be submitted to the City within five (5) calendar days of completion of fieldwork.
 5. If the inspection digital images, video files, or additional information are not complete or the quality is not satisfactory, the pipeline shall be inspected again at the Contractor's expense.
- C. Digital images and video inspection files shall be of standard format for integration into databases. Contractor shall submit file format types to Engineer for approval prior to commencing Work in accordance with Section 01 33 00.

1.5 REFERENCES

- A. National Association of Sewer Service Companies (NASSCO):
 - 1. Manual of Practices – Wastewater Collection Systems: 2001 Edition
 - 2. Pipeline Assessment & Certification Program (PACP):
http://nassco.org/training_edu/te_pacp.html
 - 3. Manhole Assessment & Certification Program (MACP):
http://nassco.org/training_edu/te_macp.html

1.6 DEFINITIONS

- A. Municipal Separate Storm Sewer System (MS4): The regulatory definition of an MS4 (40 CFR 122.26(b)(8)) is "a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):
 - 1. Owned or operated by a state, city, town, borough, county, parish, district, association, or other public body (created to or pursuant to state law) including special districts under state law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Clean Water Act that discharges into waters of the United States.
 - 2. Designed or used for collecting or conveying stormwater;
 - 3. Which is not a combined sewer; and
 - 4. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2."

1.7 QUALITY ASSURANCE

- A. All MS4 inspectors shall have been trained and certified as having passed the NASSCO Pipeline Assessment and Certification Program (PACP). All MS4 inspectors shall have successfully inspected a minimum of 100,000-linear feet of storm sewers using PACP methods. Proper evidence of inspector training and experience shall be provided prior to commencing the Work.
- B. All MS4 basin inspectors shall have been trained and certified as having passed the NASSCO Manhole Assessment and Certification Program (MACP). All MS4 basin inspectors shall have successfully inspected a minimum of 2,000 storm sewer structures using MACP methods. Proper evidence of inspector training and experience shall be provided prior to commencing the Work.
- C. Contractor shall be responsible for ensuring that results of storm sewer inspections are reported uniformly and consistently by all inspection crews.

PART 2 PRODUCTS

2.1 MS4 INSPECTIONS/MS4 BASIN INSPECTION EQUIPMENT

- A. Equipment used for inspections shall be specifically designed and constructed for storm sewer pipeline and structure inspection. Equipment shall be waterproof and operative in 100% humidity conditions, as well as any other conditions that may be encountered in a storm sewer environment. Equipment shall be capable of clearly televising the interior of storm sewers with the sizes and dimensions to be encountered during the Work.
- B. Inspection camera shall be 100% digital. Any analog or National Television System Committee video camera shall be deemed unacceptable. The camera system shall have color pan and tilt capabilities with a 360-degree rotational scan. The tilt arc must not be less than 225-degrees and the viewing angle shall be a minimum of 300-degrees. The adjustment of the focus and iris shall provide a minimum focal range from 6-inches in front of the camera's lens to infinity. The distance along the storm sewer in focus from the initial point of observation shall be a minimum of twice the vertical height of the storm sewer. The radial view camera shall be solid state color and have remote control of the rational lens. Camera shall be capable of viewing the complete circumference of the storm sewer. Cameras incorporating mirrors for viewing sides or using exposed rotating heads are not acceptable. The camera lens shall be an auto-iris type with remote controlled manual override.
- C. Inspection camera system shall be of proper height to allow inspection of the storm sewer, service lateral connections, structures, and all defects.
- D. Inspection camera system shall be of such quality as to enable the following to be achieved:
 - 1. Color: With the monitor adjusted for correct saturation, the six colors, plus black and white, shall be clearly resolved with the primary and complimentary colors in order of decreasing luminance.
 - 2. Linearity: The background grid shall show squares of equal size, without convergence or divergence over the whole picture. The center circle shall appear round and have the correct height and width relationship (+/- 5%).
 - 3. Resolution: The live picture must be displayed on a monitor capable of providing a clear, stable image free of electrical interference and with a minimum horizontal resolution not less than 500-lines.
 - 4. Color Consistency: To ensure the camera shall provide similar results when used with its own illumination sources, the lighting shall be fixed in intensity prior to commencing the inspection. In order to ensure color consistency, no variation in illumination shall take place during the inspection.
- E. Inspection camera, monitor, and other components of the equipment shall be capable of receiving and transmitting a picture having not less than 500-lines of resolution showing the entire periphery of the storm sewer.
- F. Inspection camera system shall be capable of including audio information in a recording of the inspection. The audio portion of the recordings shall be sufficiently free of

electrical interference and background noise to produce an oral report that is clear and complete and easily discernible.

- G. Illumination must be such as to allow an even distribution of the light, producing a clear picture around the storm sewer perimeter, regardless of diameter and without the loss of contrast, flare out of picture, or shadowing. Illumination shall minimize reflective glare and the intensity shall be fully adjustable. Illumination shall light the entire periphery of the storm sewer for a distance of 30-feet ahead of the camera.
- H. Inspection camera shall include a high-intensity side viewing lighting system to allow illumination of internal sections of lateral storm sewer connections.
- I. Inspection camera shall be mounted on a tractor such that the central axis of the camera is aligned with the central longitudinal axis of the storm sewer.
- J. Inspection camera system shall collect all necessary data in either the forward or reverse tractor direction. Systems collecting data only in the reverse direction will be deemed unacceptable.
- K. Inspection camera system shall incorporate an automatically updated measurement meter (displayed on monitor and electronic recordings) of the distance along the storm sewer from the calibration point to the center point of the inspection camera accurate to the nearest tenth of a foot. Accuracy of the measurement meter shall be checked daily by use of a walking meter, roll-a-tape, or other suitable device.
- L. Inspection camera system shall have adequate cable/reach so that more than one section of storm sewer may be inspected per set-up due to possible buried manholes or junction boxes.
- M. Equipment, if determined to be unsatisfactory by the Engineer, shall be removed from the Project Site and replaced with acceptable equipment at no additional cost. Contractor shall certify that backup equipment is available and can be delivered to the Project Site within twenty-four (24) hours.

2.2 MS4 INSPECTIONS/MS4 BASIN INSPECTION REPORTING SOFTWARE

- A. Contractor shall utilize an inspection and reporting software which is PACP and MACP certified by NASSCO.
- B. Contractor shall provide the Owner and Engineer with one copy each of software that is compatible with the inspection and reporting software used by the Contractor which allows viewing of the storm sewer inspection data in electronic format.
- C. Inspection and reporting software shall be capable of displaying inspections in real time or at a later time after being recorded. Software shall be capable of recording inspections in MPEG or in an electronic format approved by the Engineer. Digital inspections shall be indexed to observations saved with a time or length reference.

- D. Inspection and reporting software shall be capable of producing digital images in JPEG or in an electronic format approved by the Engineer from any location within the storm sewer.
- E. Inspection and reporting software shall be capable of importing inspection data from any PACP certified software. Software shall be capable of generating a PACP compatible export file.
- F. Inspection and reporting software shall incorporate the measurement meter reading from the inspection camera equipment automatically into the inspection report. The measurement meter reading shall correspond to the noted defect or location. Software shall be capable of generating a tabular report of all such notations.
- G. Contractor shall use software with PACP templates for feature and defect coding.

PART 3 EXECUTION

3.1 MS4 INSPECTIONS/MS4 BASIN INSPECTION

- A. Contractor shall test the inspection camera system equipment at least once per week during the Work to verify the picture quality. The equipment's manufacturer recommendations shall be used to clearly differentiate between the following colors: white, yellow, cyan, green, magenta, red, blue, and black.
- B. Contractor shall verify Site conditions prior to commencing any inspection activities. Site conditions include, but are not limited to, accessibility, traffic control, and encroachment onto private or public property. Selection of inspection equipment shall be based on the conditions of the storm sewer and structures at the time the Work commences.
- C. Contractor shall protect the storm sewer and adjacent properties from damage that might result from inspections. Any damage caused by the Contractor's operations shall be repaired to the complete satisfaction of the Engineer at no additional cost to the Owner.
- D. Perform storm sewer cleaning per Section 30 10 05.
- E. All storm sewer inspection work, including storm sewer inspection procedures and field observations reporting procedures shall be in accordance with NASSCO guidelines.
- F. Contractor shall immediately notify the Engineer of any storm sewer where a collapse has occurred or is imminent.
- G. Whenever possible, Contractor shall complete the inspection of a section of storm sewer in one continuous run. Contractor shall complete each section of storm sewer in its entirety before stopping activities for a particular day. Recordings of inspections included in the report shall be continuous between structures. Multiple sections of storm sewer may be included in a single recording. A single section shall not span multiple recordings.

- H. Contractor shall ensure maximum production per day with each Project Site inspection to minimize the time at each location, reduce backups from plugging, maintain traffic flow, and minimize safety concerns.
- I. Engineer or Resident Project Representative shall have access to remotely view and observe all inspections and operations at all times. Contractor shall have all recorded inspections and necessary playback equipment readily accessible for review by the Engineer or Resident Project Representative during the Work.
- J. Data Collection
1. Camera shall move through the storm sewer in a stable condition and at a uniform rate throughout the inspection, stopping when necessary to ensure proper documentation of internal conditions, features, or defects. Camera shall travel no faster than 30-feet per minute.
 2. Camera shall be positioned to reduce the risk of distortion. Camera shall be positioned centrally within the storm sewer. The top of the storm sewer shall correspond to the top of the lens unless adjusting the lens to view a particular defect or feature.
 3. Contractor shall display at least 75% of the pipe wall at all times during inspection so that defects, features, and other notable information can be collected. Contractor shall reduce the flow by use of pipe plugging or bypass pumping when necessary.
 4. At least 90% of the pipeline shall be free of solids, sediment, or debris. If the pipe is less than 90% free of solids, sediment, and debris Contractor shall submit photographs of the pipeline to the Engineer to determine if the pipeline should be cleaned. The Engineer or Resident Project Representative may make this determination at the Site using the Contractor's video inspection equipment. Contractor shall clean the pipeline as directed by the Engineer or Resident Project Representative.
 5. At the start of the inspection for a particular section of the storm sewer the following data shall be clearly displayed on the monitor and recording of data in alphanumeric form:
 - a. Measurement meter with current position.
 - b. Size (inside diameter or dimensions) of the pipeline (examples: 15-inches, 2-feet high by 3-feet wide).
 - c. Shape of the pipeline.
 - 1) Arch
 - 2) Box
 - 3) Circular
 - 4) Elliptical
 - 5) Unknown
 - d. Length of the pipeline.
 - e. Material of the pipeline, including any change in material.
 - 1) Brick
 - 2) Concrete
 - 3) Corrugated Metal Pipe (CMP)
 - 4) Ductile Iron (DI)
 - 5) High Density Polyethylene Pipe (HDPE)

- 6) Poly Vinyl Chloride (PVC)
 - 7) Reinforced Concrete Pipe (RCP)
 - 8) Unreinforced Concrete Pipe (CP)
 - 9) Vitrified Clay Pipe (VCP)
 - 10) Unknown
- f. City of Durham facility ID for upstream and downstream structures as well as the pipe line.
 - g. Date and time of inspection.
 - h. Road name or location.
 - i. Direction of inspection (upstream or downstream).
6. Once the inspection of the storm sewer is underway, specific data should be continuously displayed on the monitor and recording. The size and position of the data should be such as to not interfere with the picture, yet shall be easily readable when viewed. At minimum, the following data should be continuously displayed:
- a. Measurement meter with current position.
 - b. City of Durham facility ID for upstream and downstream structures.
7. MS4 Inspections (Storm Sewer): In addition to the digital images and video files the following information shall be collected for each storm sewer inspection.
- a. The conditions in which the inspection was conducted.
 - 1) Dry weather with no flow.
 - 2) Wet weather with some base flow.
 - b. Accurate distances from starting point to all connections and drainage structures encountered during the inspection.
 - c. Size, material, shape, and location of all connections to the pipeline. This information shall include a description of any flow coming from the service connections (example: 10-inch, HDPE, circular, continuous flow).
 - d. City of Durham facility ID, size (inside diameter or dimensions), type, and material of all drainage structures connecting the pipelines. This information shall include the size, material, shape, and location of all connections to the drainage structure.
 - 1) Types
 - a) Combination Inlet
 - b) Curb Inlet
 - c) Drop Inlet
 - d) End Section
 - e) Junction Box
 - f) Slab Type Drop Inlet
 - g) Manhole
 - h) Unknown
 - 2) Materials
 - a) Brick
 - b) Concrete Block
 - c) Pre-Cast Concrete
 - d) Unknown
8. MS4 Basin Inspection: In addition to the digital images and video files the following information shall be collected for each basin inspection.

- a. The date and time of the inspection.
 - b. The conditions in which the inspection was conducted.
 - 1) Dry weather with no flow.
 - 2) Wet weather with some base flow.
 - c. City of Durham facility ID.
 - d. Size (inside diameter or dimensions) of the basin (examples: 4-feet, 3-feet by 3-feet wide).
 - e. Type of basin.
 - 1) Types
 - a) Combination Inlet
 - b) Curb Inlet
 - c) Drop Inlet
 - d) End Section
 - e) Junction Box
 - f) Slab Type Drop Inlet
 - g) Manhole
 - h) Unknown
 - f. Basin material.
 - 1) Materials
 - a) Brick
 - b) Concrete Block
 - c) Pre-Cast Concrete
 - d) Unknown
 - g. Size, material, shape, and location of all service connections to the basin. This information shall include a description of any flow coming from the service connections (example: 10-inch, HDPE, circular, continuous flow).
9. Contractor shall produce five images for each pipeline section of storm sewer (MS4 Inspections) or structure (MS4 Basin Inspection), at a minimum. Additional images may be necessary, depending upon storm sewer conditions, to document unusual, questionable, or severe conditions. Images of all service connections and all defects with a NASSCO PACP defect grade of 4 or 5 are mandatory and shall be included in the inspection report.
10. The audio portion of the recordings shall provide a voice narrative of general information and observations made during the inspections. The narrator's voice should be clear and discernible. Voice descriptions shall include the following information:
- a. City of Durham facility ID of the storm sewer or structure.
 - b. Direction of inspection (upstream or downstream).
 - c. Descriptions of defects, infiltration, leaking, service connections, general observations, unusual or severe conditions.
11. Contractor shall document in writing all pipelines and structures discovered as part of the inspection. The location of buried drainage structures shall be marked above ground using survey grade marking paint. Contractor shall immediately notify the Resident Project Representative of all pipelines and structures discovered as part of the inspection.

12. Contractor shall stop inspection camera and use pan and tilt features to document and provide the best possible image of all connections and defects encountered in the storm sewer.
13. Inspection camera shall be kept level and pointed straight ahead while moving through the storm sewer.
14. Contractor shall not be required to fully inspect service laterals smaller than 15-inched in diameter. However, camera should be rotated during inspection in order to provide an internal view of the service lateral. The position and stationing of each service lateral shall be noted in the inspection report.
15. Obstructions may be encountered during the course of the inspection that prevent the travel of the inspection equipment. Each occurrence shall be considered separately. Generally, however, the Contractor shall first attempt to pass the obstruction, and if failing in this attempt or if equipment damage may occur, Contractor shall withdraw the equipment and attempt inspections from the opposite end of the storm sewer. Should additional obstructions be encountered after the first re-employment and no means are available for passing the obstructions without damage to the equipment, then the remaining sections of the storm sewer not inspected shall be excluded from the Work requirements of the Contract. No additional payment shall be made due to difficulties encountered during internal inspection. In addition, the Contractor shall have no claim for payment for internal inspection not completed due to obstructions. An alternate method of moving the camera may be suggested by the Contractor to complete inspections of storm sewers with obstructions. The inspection shall be attempted to determine the condition of as much of the storm sewer as possible. The Contractor shall select the method of performing the inspection (i.e. pushing, pulling, or self-propelled) approved by the Engineer. The extent of the inspection accomplishment shall be at the discretion of the Engineer. Should the Contractor's inspection equipment become immobilized within a pipeline, said equipment shall be removed from the line. If excavation is required to retrieve the Contractor's equipment, the excavation shall be accomplished at the Contractor's expense. Following removal of the equipment, the Contractor shall restore the storm sewer and the Project Site in accordance with the construction specifications of the governing body having jurisdiction.
16. Picture quality and definition shall be to the satisfaction of the Engineer, and if unsatisfactory, inspection shall be performed again with the appropriate changes made as designated by the Engineer at no additional cost to the Owner.

K. Data Review, Reporting, and Delivery

1. Contractor shall review collected data, code observations, and complete a full NASSCO Pipeline Assessment & Certification Program (PACP) evaluation of each inspected storm sewer section.
2. Contractor shall review collected data, code observations, and complete a full NASSCO Manhole Assessment & Certification Program (MACP) evaluation of each inspected basin.

END OF SECTION

SECTION 30 10 05

STORM SEWER CLEANING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Unit Price Work – Measurement and payment.
 - 2. Scope of Work.
 - 3. Submittals.
- B. Related Sections:
 - 1. Section 30 10 00: Municipal Separate Storm Sewer System (MS4) Inspections
 - 2. Section 30 11 00: Project Special Provisions.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Cleaning for MS4 Inspections (Location, Condition, and Illicit Discharge Verification):
 - 1. Basis of Measurement: Lump Sum
 - 2. Basis of Payment: Includes the work described in this specification and will be paid as the actual number of hours the Contractor's personnel is actively engaged in performing cleaning in order to perform MS4 inspections. Unit price for the cleaning shall include all costs for removal and disposal of all shapes, sizes and quantities of materials from the storm sewer. Unit price for the flushing shall include costs for all safety precautions outlined in the General Requirements, or required by agencies having jurisdiction.

1.3 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, services, and incidentals required to perform cleaning of the designated storm sewers. Storm sewer walls shall be cleaned adequately to provide for proper inspection to discern structural defects, misalignment, infiltration/inflow, and sources of leaking.
- B. Cleaning shall include the proper high pressure water jetting, rodding, bucketing, brushing, and flushing of storm sewers and structures prior to inspection.
- C. Cleaning may involve preparatory or light storm sewer cleaning (small amounts of debris and/or light root growth existing within the storm sewer) or heavy storm sewer cleaning (large amounts of debris, large size stones/bricks, and/or heavy root growth existing within the storm sewer).
 - 1. Preparatory or light cleaning is defined as all cleaning up to and including three passes of high pressure water jetting.
 - 2. If, after three passes of high pressure water jetting, the storm sewer is still not clean, Contractor shall inform the Engineer of the condition and the reason(s) for the failure to fully clean the storm sewer. The Engineer may then direct the

Contractor to perform heavy cleaning of the problem section of the storm sewer. Contractor will be reimbursed for only that heavy cleaning which is approved by the Engineer.

- D. Cleaning shall dislodge, transport, and remove all dirt, sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, asphalt, concrete, and all other debris from the interior of the storm sewer.

1.4 SUBMITTALS

- A. Submit to Engineer, in accordance with Section 01 33 00, the proposed cleaning method and equipment to be used for each segment of the storm sewer to be cleaned.
- B. Submit to the Engineer, in accordance with Section 01 33 00, the proposed disposal site for material removed from the storm sewer during cleaning operations.
- C. Submit to the Engineer, in accordance with Section 01 33 00, the following items at least two weeks prior to initial flushing.
 - 1. Cleaning start date.
 - 2. Estimate of how much decant water will be sent into the storm sewer.
 - 3. Time of decant water (total number of days anticipated and hours each day).

PART 2 PRODUCTS

2.1 EQUIPMENT

- A. Hydraulic High Pressure Jet Equipment
 - 1. Hydraulic high pressure jet equipment shall have the following:
 - a. Minimum of 500-feet of high pressure hose.
 - b. Two or more high velocity nozzles capable of producing a scouring action from 15 to 45 degrees in all storm sewer sizes to be flushed.
 - c. High velocity gun for washing and scouring storm sewer structure walls and floors. Gun shall be capable of producing flows from a fine spray to a long distance solid stream.
 - d. Water tank, auxiliary engines and pumps, and a hydraulically driven hose reel.
 - e. Equipment operating controls located above ground.
- B. Mechanical Cleaning Equipment
 - 1. Mechanical cleaning equipment shall be either power buckets or power rodders. The equipment may be necessary for the removal of roots or heavy debris.
 - a. Power bucket equipment shall have the following:
 - 1) Buckets in pairs and with sufficient dragging power to perform work efficiently.
 - 2) Use v-belts for power transmission or have an overload device. No direct drive machines shall be permitted.
 - 3) Take up drum and a minimum of 500-feet of cable.

- 4) Capability to drag storm sewer with buckets, brushes, scrapers, swabs or other similar devices.
- b. Power rodder equipment shall have the following:
 - 1) Sectional or continuous.
 - 2) Hold a minimum of 750-feet of rod.
 - 3) Rod with specifically treated steel.
 - 4) Fully enclosed and have an automatic safety throw out clutch or relief valve.
 - 5) Capability of cleaning distances covered under the Contract in one step.
 - 6) Capability of spinning the rod either clockwise or counter-clockwise.
 - 7) Capability of pushing or pulling the rod without rotating the machine.
- C. The equipment selected for cleaning shall be capable of removing dirt, sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, asphalt, concrete, and all other debris from the storm sewer.
- D. Where the Engineer has approved cleaning to be performed in advance of inspection, the Contractor shall clean storm sewers utilizing cleaning equipment approved for use by the Engineer.
- E. All cleaning equipment, including machines, devices, tools, etc., required for the entire cleaning operations shall be owned or leased and operated by the Contractor. Contractor shall certify that backup cleaning equipment is available and can be delivered to the site within twenty-four (24) hours. The Contractor shall also submit his equipment list to the Engineer before commencement of the Work.

PART 3 EXECUTION

3.1 MAN ENTRY

- A. Storm sewers included in the Work are large enough to allow man entry.

3.2 PREPARATION

- A. Selection of cleaning equipment shall be based on the conditions of the storm sewer at the time the Work commences. Equipment and methods selected shall be acceptable to the Engineer. However, acceptance of a proposed method does not relieve Contractor of responsibility to adequately clean the storm sewer to allow performance of the Work, nor does it relieve Contractor of liability for damages to the pipe as a result of inappropriate cleaning methods.
- B. Use properly selected equipment to remove all dirt, sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, asphalt, concrete, and all other debris.

- C. Contractor shall obtain prior approval from the Engineer before using the local public water supply and shall comply with all Federal, State, and City laws and regulations concerning water drawn from a public water supply. Waste of water by Contractor shall be sufficient cause for withdrawing the privilege of unrestricted water use. Hydrants shall only be operated under the supervision of the Engineer's personnel.
- D. No storm sewer cleaning shall take place in a particular storm sewer segment until all the upstream segments have been cleaned. If cleaning is done in a downstream pipe segment in order to facilitate overall cleaning operations, the segment shall be re-cleaned at no additional cost, after all segments upstream of that segment have been cleaned.

3.3 PERFORMANCE

- A. Cleaning shall be performed in the seventy-two (72) hour period immediately before inspection.
- B. All precautions shall be taken by the Contractor to protect the storm sewer from damage that may result from the use of unsuitable equipment or improper use of approved cleaning equipment. Any storm sewers damaged during cleaning operations as a result of the Contractor's operations shall be promptly repaired to an acceptable condition by and at the expense of the Contractor. Engineer will determine the acceptable condition.
- C. If the Contractor's cleaning equipment becomes immobilized within a storm sewer, exits the line through broken pipe or portions break off within a storm sewer, said equipment shall be retrieved at the Contractor's expense. The Contractor shall act immediately to remedy problems created by the cleaning procedure, which represent a hazard to the general public, such as the collapse of the ground surface above a storm sewer. Contractor shall be responsible for any costs associated with equipment retrieval that necessitates excavation. Following removal of the equipment, the Contractor shall restore the line and the site in accordance with the construction specifications of the governing body having jurisdiction.
- D. If cleaning of an entire section cannot be successfully performed from one access point, the equipment shall be set up at another access point and cleaning attempted again. If successful cleaning cannot be performed from the second access point, or the equipment fails to traverse the entire length between the access points, it will be assumed that a major blockage exists and the cleaning effort shall be abandoned until which time the blockage is identified and resolved by man entry. Any suspected blockages shall be reported to the Engineer immediately.
- E. Take all precautions to avoid damage or flooding to public or private property served by the storm sewer.
- F. Removal of Materials
 - 1. Remove all dirt, sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, asphalt, concrete, and all other debris at the downstream structure of the section being cleaned.
 - 2. Passing material from one section of the storm sewer to another is not permitted.

3. Contractor shall be responsible for the removal of all material and equipment from the Site and restoring the Site to its original condition.

G. Disposal of Materials

1. Remove from the Site and properly dispose of all dirt, sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, asphalt, concrete, and all other debris recovered during the cleaning operation.
2. Under no circumstances shall the accumulation of dirt, sludge, mud, sand, gravel, rocks, bricks, grease, roots, sticks, asphalt, concrete, and all other debris be permitted, unless prior written authorization is given by the Engineer.
3. Contractor shall comply with all applicable Federal, State, and City laws and regulations concerning disposal of materials.
4. Dispose of all materials removed from the storm sewer not designated as regulated material or Acid Producing Soil, as follows:
 - a. Once material leaves the Project Site, the Contractor shall be responsible for ensuring that the handling procedures, placement method, and disposal location are according to applicable Federal, State, and local laws, rules, and requirements, including permits that may be issued for the Project.
 - b. If the disposal of excess material results in a violation notice from any governmental authority, immediately correct the violation. Contractor shall indemnify and defend the City of Durham for any violation incurred, penalty assessed, or any claims, suits, losses, demands or damages of whatever kind or nature arising out of, or claimed to arise out of, the improper disposal of excess materials.
 - c. If the Contractor does not correct the violation to the satisfaction of the governmental authority that issued the violation notice, the Contractor is responsible for assessed penalties including costs incurred by the City of Durham to remedy the violations.
5. For Hazardous Waste, Contractor shall pay fees associated with removal and disposal of Hazardous Waste. Submit the results of material sampling and analysis, waste facility applications and acceptance documentation, and fee payment requirements to the Engineer at least fifteen (15) days before planned removal of Hazardous Waste. Submit to the Engineer a bill of lading for each truckload of Hazardous Waste removed from the Project Site. Ensure that the bill of lading and waste manifest include the following information:
 - a. Transport Subcontractor name, address, permit number, and telephone number.
 - b. Type and quantity of Hazardous Waste removed.
 - c. Weight of vehicle with weigh slip.
 - d. Recycling or disposal facility name, address, permit number(s), and telephone number(s).
 - e. Date removed from the Project Site.
 - f. Signature of transport vehicle operator.
 - g. The Engineer will sign the bills of lading for the City of Durham as the generator within the Project Site. Submit one (1) copy of the bill of lading to the Engineer by the end of each working day that the transport vehicle leaves the site. The licensed hauler shall transport the Hazardous

Waste to the disposal/recycling facility with no unauthorized stops in between, except as required by regulatory authority. The hauler shall use appropriate vehicles and operating practices to prevent spillage or leakage from occurring during transport. Remove excess soil adhering to the wheels or under carriage of the vehicles before leaving the Project Site. If soil or water escapes to the public roads, immediately clean the road to restore it to the original condition and immediately notify the Engineer. Do not transport Hazardous Waste over public roads if they contain free liquid or are sufficiently wet to be potentially flowable during transport. Submit one (1) copy of the documentation of the disposal facility's acceptance of the Hazardous Waste, including the weight ticket slips, to the Engineer within fifteen (15) days of acceptance at the disposal facility. Immediately submit written notification to the Engineer if problems arise, regarding the facility chosen to accept the Hazardous Waste for off-site management, that would require the return of waste, or if the chosen facility has violated any environmental regulation that may result in regulatory enforcement action. Propose an alternate disposal facility, and obtain the Engineer's written approval of off-site management at such facility.

- H. All decant water discharged to downstream storm sewer must have a turbidity of not greater than 50 NTU.

3.4 FIELD QUALITY CONTROL

- A. Acceptance of storm sewer cleaning shall be contingent on satisfactory completion of the MS4 inspections. If MS4 inspections show the cleaning to be unsatisfactory as determined by the Engineer, the storm sewer shall be re-cleaned and re-inspected, until the cleaning is shown to be satisfactory, at no additional cost to the Owner.
- B. The Engineer reserves the right to test the decant water at any time. If the turbidity exceeds 50 NTU, the decant water will no longer be allowed to be discharged into the downstream storm sewer system and must be disposed of properly at no additional cost to the Owner.

END OF SECTION